Revised at 16th Apr, 2019

BFC-D40-22-1-2 v.01b

40MM VERY-LOW-OHM FULL RANGE SPEAKER

STAPEZ™ brand Very-Low-Ohm (VLO) speaker.

FEATURE HIGHLIGHTS:

- 1Ω in DCR
- Designed for single 18650 Li-ion battery (3.6-4.2V) without voltage boost converter.
- Also works great with 2-3 AA-size NiMH cells
- High power handling : 3.5W (continuous), 8W (transient)
- Peak-to-peak excursion of 5mm
- Full-range frequency response
- NdFeB magnet, paper cone, and PU surround
- 40mm diameter

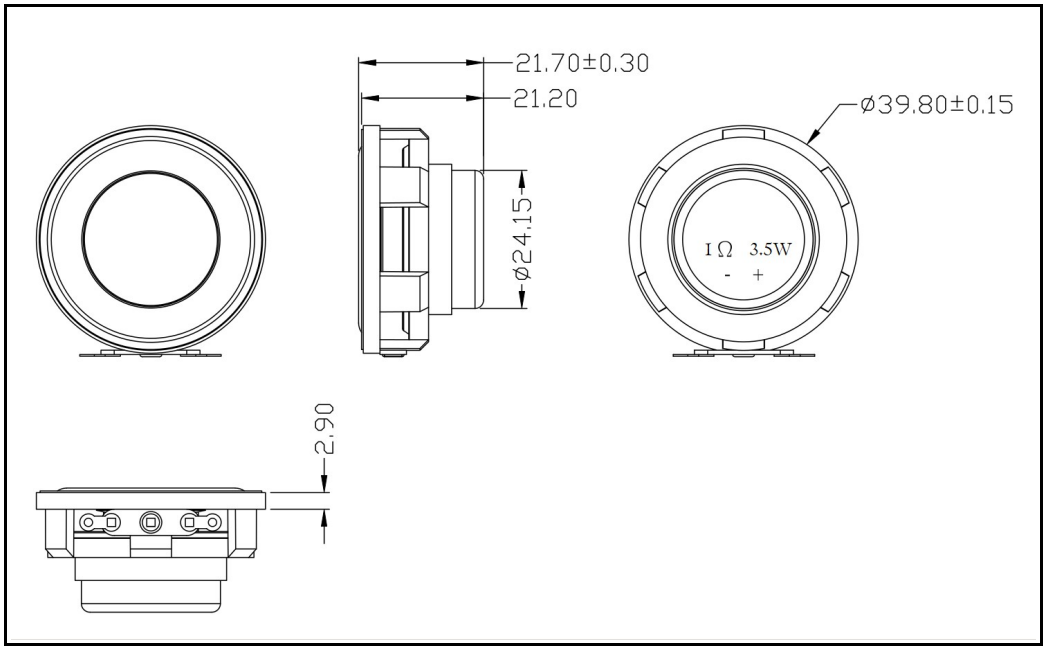
APPLICATIONS:

- Portable Bluetooth speakers: single Li-ion cells (3.6-4.2V) (single-cell power management is a lot easier to implement)
- WiFi / Smart Voice Assistant speaker
- Computer monitors with high audio performance
- Speaker Array (series to higher impedance)
- Hi-Fi speaker array with subwoofer.
- DIYers, Makers, and Robotics.

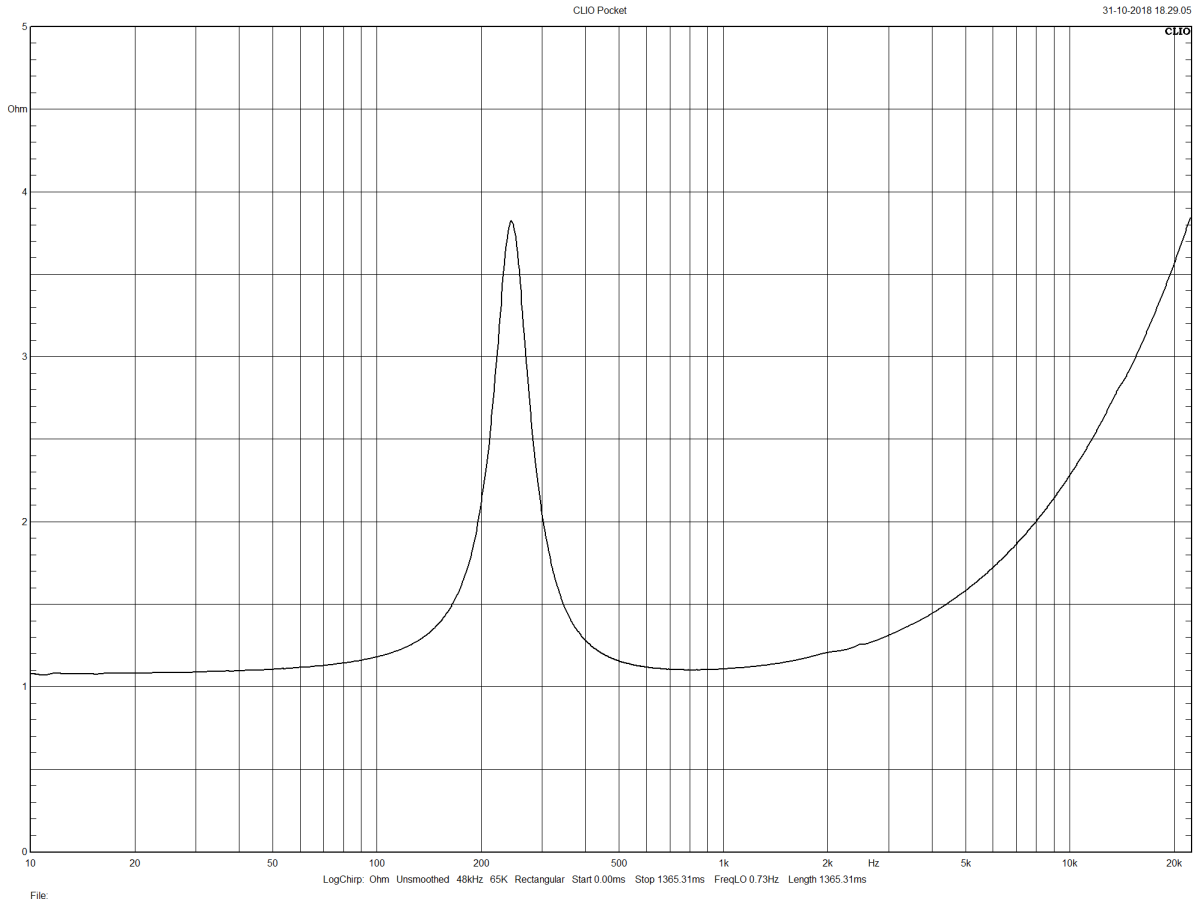
1:1 size in A4 paper

DRAWINGS AND DIMENSIONS:

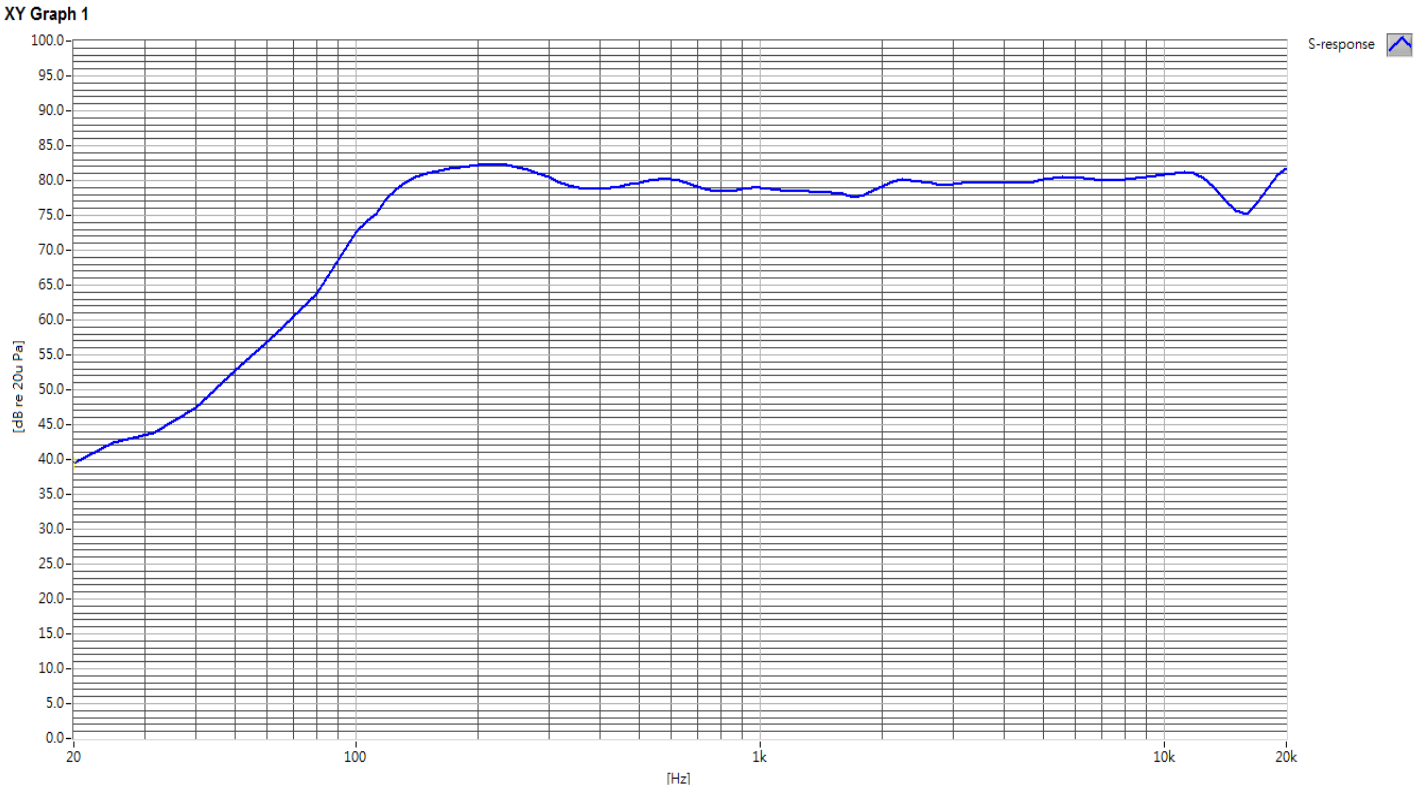
All units are in mm unless specified.



Impedance Curve vs Frequency:



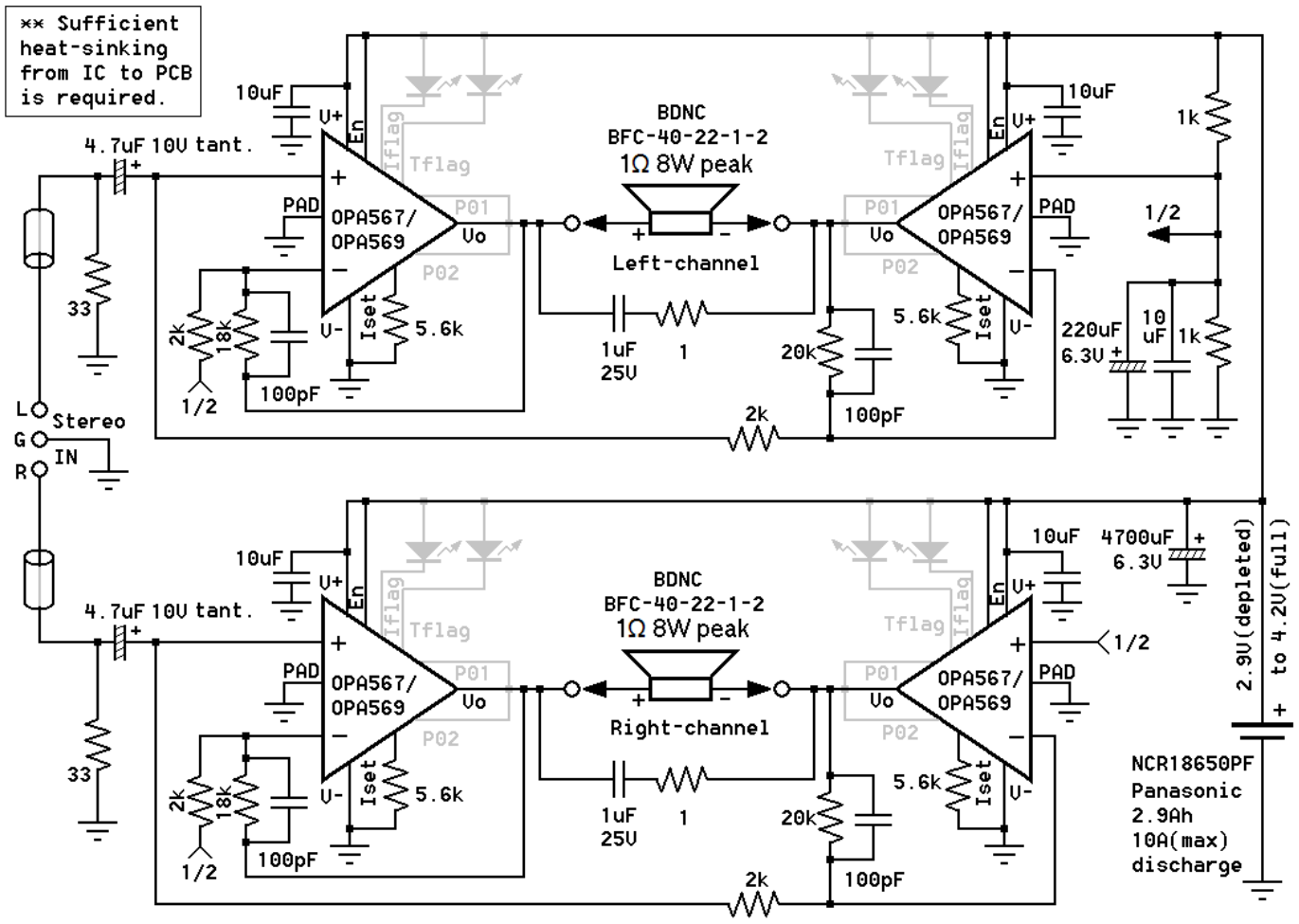
Frequency Response Curve:



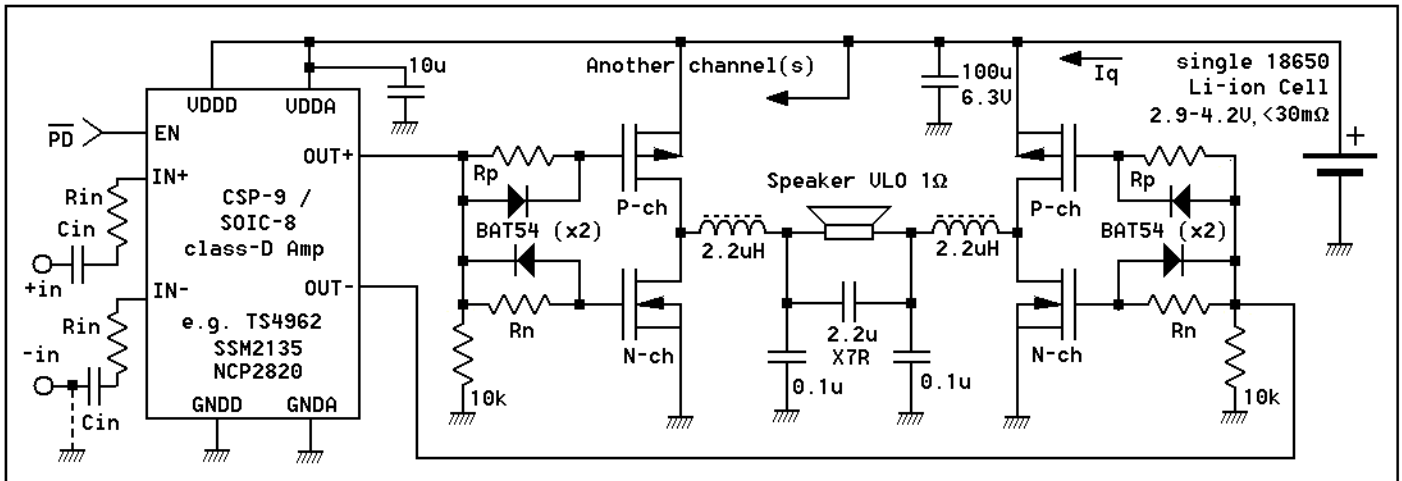
ELECTRICAL, ACOUSTICAL, AND THIELE/SMALL PARAMETERS:

Parameter	Min.	Typical	Max.	Testing Conditions
DC Resistance (Re)		1Ω	1.2Ω	
Resonance Frequency (Fs)		208Hz		
Continuous Power (thermal)		3.5W		
Max. Power (transient)		8W		
Excursion, peak-to-peak (Xmax)		5mm		
Moving Mass (Mms)		0.95g		
Effective Radiating-area (Sd)		8 cm^2		
Force Factor (BL)		0.96		
Specific Force Factor (BL/√Re)		0.96		
Compliance, free-air (Cms)		0.61mm/N		
Eqv. Compliance Volume (Vas)		0.043L		
Voice Coil Inductance (Le)		0.01mH		
Diaphragm Displacement Volume, peak-to-peak(Vd)		4.8 cm^3		
Sensitivity (1V/0.5m@1kHz)		83dBSpl		
NdFeB magnet rating		N35		
NdFeB magnet weight		8.5g		
Voice-coil magnet wire weight		0.76g		
Driver Weight		34.8g		
Voice-coil magnet wire grade		EISV		
Max. Voice-coil Temperature		180^oC		
Operating Temperature		-10 to 40 ^oC		
Storage Temperature		-20 to 70 ^oC		

STEREO APPLICATION TESTING CIRCUIT:



CLASS D AMPLIFIER APPLICATION CIRCUIT:



1). N- and P-ch MOSFETs should be low Ron, low Vdss and short turn-off time. Examples are (Diodes) DMN3404L-7 / DMP1045U-7, (Vishay) SI2374DS / SI2365, and (A&O thermal-pad) AON7410 / AONR21321.

2). Resistors Rp and Rn set quiescent current Iq vs. sound quality and EMI (fixed IC and MOSFETs):
 a). Decide Iq wanted but not a figure too low. A 3Ah 18650 cell works for 60 hours under 50mA Iq.
 b). With Vdd = 4.2V, set Rp=0 and varies Rn until Iq(temp) = 1.5 to 1.8 Iq (wanted).
 c). With now defined Rn values, varies Rp until desired Iq is achieved.

3). For Cin and Rin values, please refer to the corresponding IC datasheet.

*Class D monolithic IC for VLO speakers is under development by BDNC.