

Piezoelectric Speaker

KSN 1141A Wide Dispersion Horn Datasheet

POWERLINE Series

Applications

Specific Applications	<ul style="list-style-type: none"> - SODAR (Wind Profiling) - LRAD Long Range Acoustic Device - Automotive, Aircraft, Trains, Ships - Radios - Medical Equipment - High Fidelity Sound Reproduction - Bioacoustics - Alarms/Alerts - Transducer - Pest Repellent (Rodents, Birds, etc.)
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KSN1141A



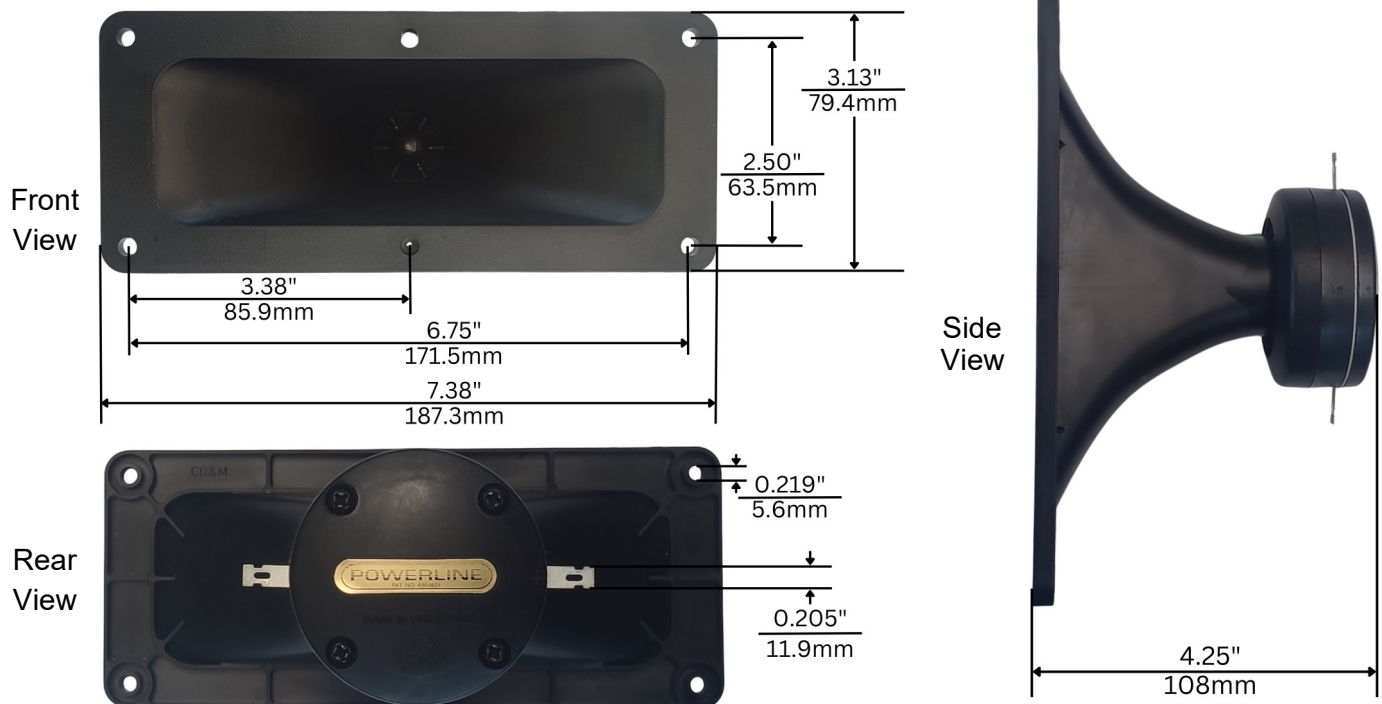
Features

1. Low power consumption
2. High sensitivity
3. Withstand harsh environment

Packaging Information

Specifications	Standard Packing Quantity	Gross Weight
14"x15"x19"	36 pcs	7.46 kgs

Appearances and Dimensions

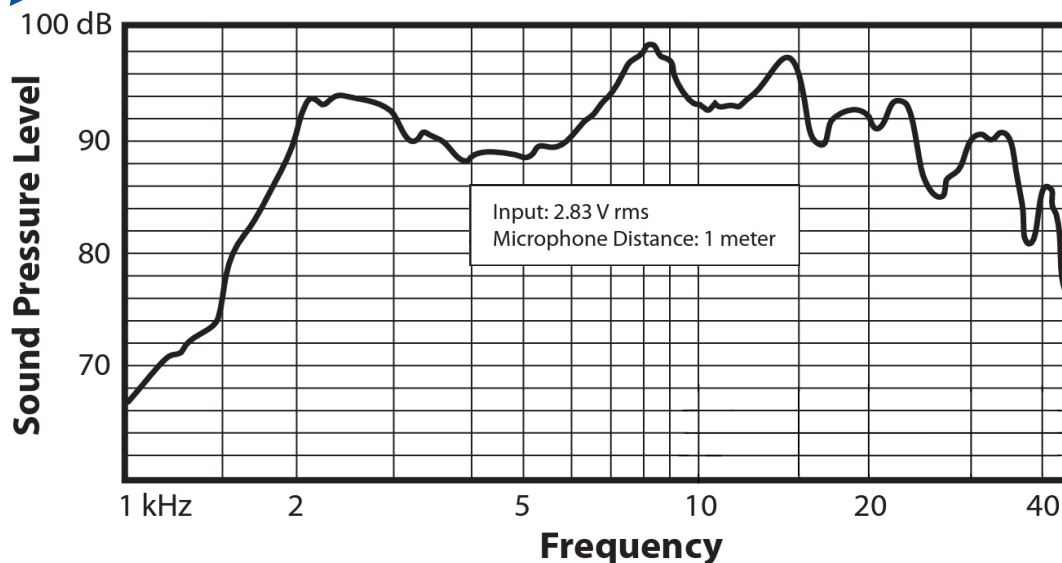


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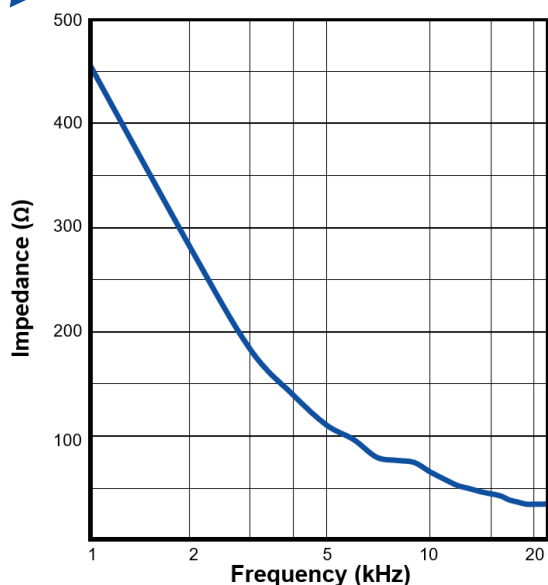
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Frequency Response



Impedance Plot



Specifications

Frequency Response	1.8kHz to 30kHz
Average Sensitivity	92dB at 1m/1W
Maximum Power Handling Capacity	400W (EIA RS426) 8Ω system reference
Maximum Temperature	80°C
Typical Impedance	Appears as a 0.3μF capacitor
Weight	130g

Warning: A 30-ohm series resistor is recommended to assure stability of extended range amplifiers and preclude hazard of burnout.

Warning: Do not operate at continuous high voltage. At frequencies below 20 kHz, daily sound pressure exposures in excess of one hour at 105 dB may lead to hearing impairment.

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Principle of Operation: Powerline Series

The KSN 1141A POWERLINE horn drivers is unique and distinct in its operation and how it works. Referring to Figure 1, the protection circuit is actually a parallel combination (U.S. Patent #4,864,624) of a miniature lightbulb and a positive temperature coefficient resistor (PTC). In a music system in which there is excessive clipping at high power or very heavy high frequency signal content, the piezo drive element sees very large currents and will heat up due to dissipation losses. In order to limit the temperature to 150°C (302°F), a PTC is chosen with a “turn-on” temperature of 120°C. Below this temperature, it appears as a simple 20 ohm resistor, and doesn’t affect the speaker response. When the amplifier power level reaches several hundred watts continuous, the PTC heats up and increases its resistance dramatically as shown in Figure 2. This has the immediate effect of lowering the power into the driver and, if no other work had been done, significantly lowering the speaker SPL. To avoid this sudden shift and to make the power control practically imperceptible, the miniature lamp is wired in parallel with the PTC.

A tungsten lamp exhibits a very low resistance when cold and a much higher resistance when warm. The lamp specifications are carefully chosen such that the speaker will continue to play even after the PTC has opened up, drawing its current now through the lamp. As the power increases further, the lamp lights up, increasing its temperature and resistance, thereby limiting the power to the speaker. The lamp is essentially a very fast acting PTC (very low thermal mass, high heat radiation) and responds to music peaks rather than RMS heating as does the PTC. The audible effect is similar to that produced by a level compressor. In this way, the driver temperature is held just below the critical 150°C temperature.

The resulting speaker performance is then as follows:

- Under normal operating conditions, the speaker performs in its normal mode, faithfully reproducing the applied signal at a proportional volume.
- Under temporary extreme high power surges (even in excess of 400 watts), the speaker will still perform in its normal expected mode.
- However, if subjected to a continuous high power, high frequency signal, the PTC temporarily opens up, allowing the speaker to continue to play, drawing its power through the lightbulb at a somewhat compressed power level. The transition is smooth, and at the power levels being played at the time, barely perceptible to the human ear. When the speaker cools off, the PTC automatically resets, and conditions return to normal.

Electrical Circuit

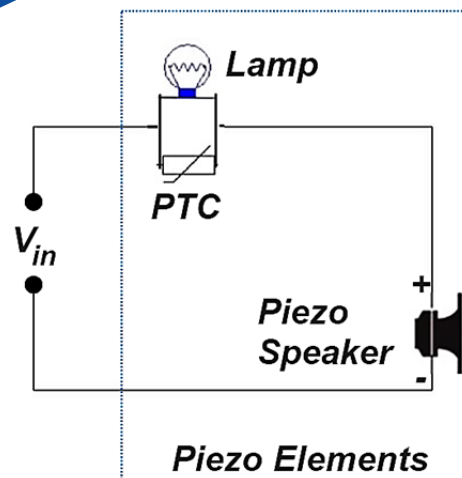


Figure 1. Powerline internal electrical circuit

Resistance-Temperature Characteristic

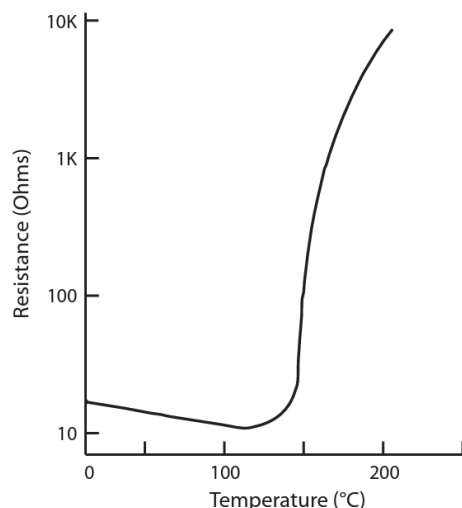


Figure 2. Resistance-temperature characteristic of a PTC resistor.