CLAIMS

1. A loudspeaker device comprising:

a micro-electromechanical unit comprising:

a diaphragm having a planar extension, the diaphragm comprising a semiconductor structure comprising a first and a second layer, each layer extending in the planar extension, wherein the first layer comprises Al(1-x)Ga(x)N, wherein $0.2 \leq x \leq 0.4$, and the second layer comprises GaN, wherein the diaphragm is arranged to oscillate in an extension transverse to the planar extension to thereby generate sound waves, and wherein a calibrating weight is arranged on a surface of the diaphragm,

a support structure supporting the diaphragm, and

an electrode connected to the diaphragm; and

a resonant box.

2. The loudspeaker device according to claim 1, wherein the diaphragm is circular in the planar extension, wherein a diameter of the diaphragm is between 1 and 50 micrometer.

3. The loudspeaker device according to claim 1, wherein the semiconductor structure of the diaphragm is a superlattice comprising GaN and Al(1-x)Ga(x)N layers, wherein $0.2 \leq x \leq 0.4$.

4. The loudspeaker device according to claim 3, wherein a periodicity of the superlattice is between 2 and 6 nm.

5. The loudspeaker device according to claim 1, wherein a thickness of the diaphragm is between 0.1 and 5 µm.

6. The loudspeaker device according to claim 1, wherein the resonant chamber comprises a backplate having a plurality of through-holes.

7. The loudspeaker device according to claim 1, wherein the electrode is ring shaped and arranged at an edge of the diaphragm.

8. The loudspeaker device according to claim 1, wherein the support structure comprises a semiconductor layer structure forming a transistor.

9. The loudspeaker device according to claim 8, wherein the semiconductor layer structure of the support structure comprises a silicon base layer.

10. The loudspeaker device according to claim 8, wherein the semiconductor layer structure of the support structure comprises a GaN layer and an Al(1-x)Ga(x)N layer, wherein $0.2 \leq x \leq 0.4$.

11. The loudspeaker device according to claim 8, wherein the semiconductor layer structure of the support structure (30) comprises an AlN layer.

12. The loudspeaker device according to claim 1, further comprising a calibrating weight arranged on a surface of the diaphragm.

13. The loudspeaker device according to claim 1, further comprising:

circuitry configured to actuate the diaphragm of the micro-electromechanical unit.

14. The loudspeaker device according to claim 13, wherein the circuitry comprises:

a driver;

a comparator; and

a first and a second GaN high electron mobility transistor, HEMT, abutting the driver;

wherein the first and the second HEMT are electrically connected to the comparator.