

Patent pending

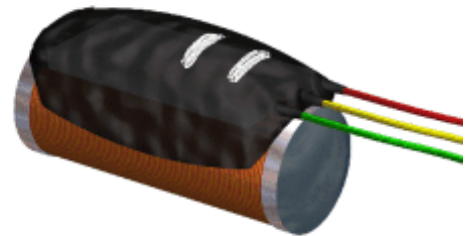
V. 1 - Oct 2002

Description

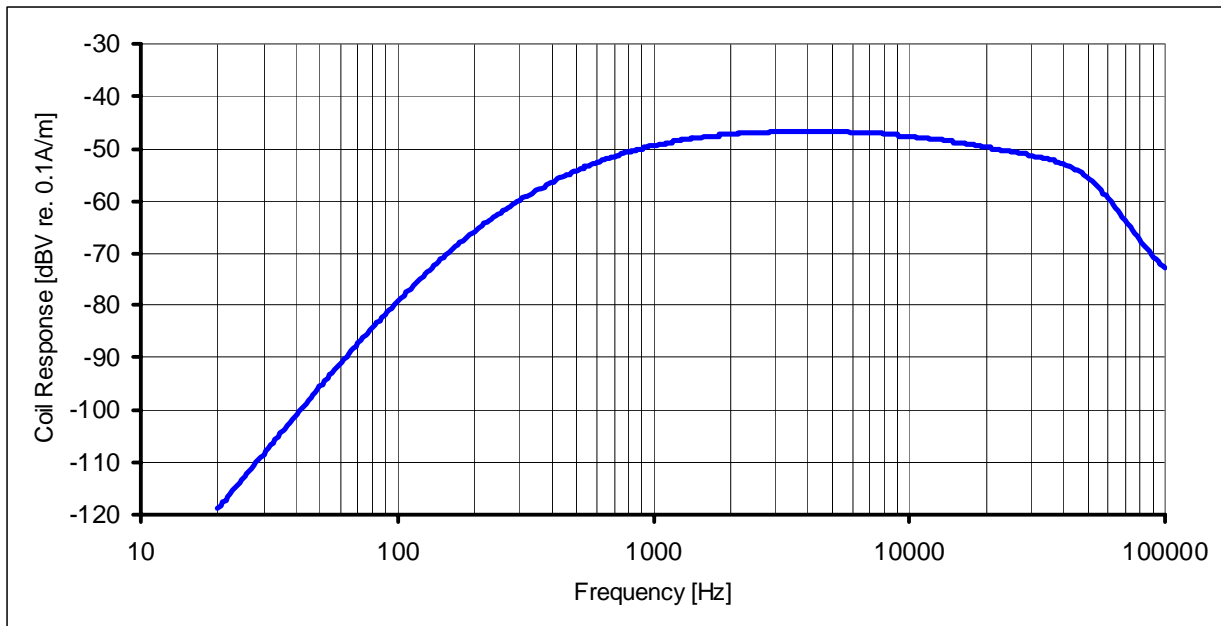
Amplified inductive pick-up coil for use in hearing instruments.

The coil has an integrated pre-amplifier with high EMI suppression for improved compatibility with digital cellular phones. Furthermore, it features a higher-order low frequency roll off for LF noise (50/60 Hz) attenuation.

The output stage is equivalent to the one found in Microtronic microphones with CMOS ICs (e.g. 6000, 96/9700 and 1M000 series), and allows direct switching between microphone and coil. The response curve is flat which ensures good matching of the telecoil and microphone response.



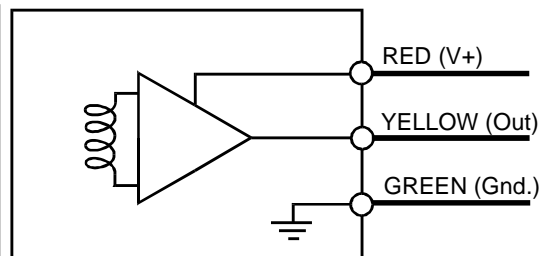
Frequency Response Curve



Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|-----------------------|-----------|-----|-----|------|
| Supply Voltage | V_{DD} | 0.9 | 3.6 | VDC |
| Operating Temperature | T_w | -10 | 50 | °C |
| Storage Temperature | T_s | -40 | 80 | °C |
| ESD * | V_{ESD} | 3 | | kV |

* Equals Class 2 product according MIL-STD-750D



Protection should be used in accordance with CCEC 000015.

Electrical Characteristics

Measuring conditions (unless stated otherwise): supply voltage 1 VDC, frequency = 1 kHz, temperature = 27 °C, H = 0.1 A/m and load 10 pF/200 kOhm. All parameters were measured according their specific MQP.

| Parameter | Symbol | Min | Typ | Max | Units | Comments | |
|--------------------------------------|------------------|---------------------|-------|-------|----------------------|--------------------------------------|--------------|
| Supply voltage | V _{DD} | 0.9 | 1.0 | 1.5 | V | | |
| Supply current | I _{DD} | 40 | 55 | 90 | µA | V _{DD} : 0.9-1.5 V | |
| DC output voltage | V _O | 450 | 580 | 800 | mV | V _{DD} : 0.9-1.5 V | |
| Output impedance | Z _{OUT} | 1700 | 3000 | 4500 | Ohm | V _{DD} : 0.9-1.5 V | |
| Sensitivity: | 200 Hz | S ₂₀₀ | -69.5 | -67.0 | -64.5 | dB re 1V/0.1Am ⁻¹ | |
| | 1000 Hz | S _{1k} | -51.5 | -49.5 | -47.5 | | |
| | 5000 Hz | S _{5k} | -49.0 | -46.5 | -44.0 | | |
| Sensitivity: | 200 Hz | S ₂₀₀ | -72.0 | -69.5 | -67.0 | dB re 1V/0.1Am ⁻¹ | 10 kOhm load |
| | 1000 Hz | S _{1k} | -54.0 | -52.0 | -50.0 | | |
| | 5000 Hz | S _{5k} | -51.5 | -49.0 | -46.5 | | |
| 1st high pass cutoff frequency | F ₁ | 175 | 217 | 270 | Hz | | |
| 2nd high pass cutoff frequency | F ₂ | 0.85 | 1.05 | 1.30 | kHz | S _{@5kHz} - 3dB | |
| 1st low pass cutoff frequency | F ₃ | 15.8 | 19.8 | 24 | kHz | S _{@5kHz} - 3dB | |
| Equivalent input noise ¹⁾ | N _i | | 30 | 32.5 | dB MFL ⁴⁾ | 0.1-10kHz (Awgt) | |
| Maximum output voltage swing | V _{OUT} | | 27 | | pk-to-pk mV | THD < 1% | |
| Maximum input signal ²⁾ | M _i | | 87.5 | | dB MFL ⁴⁾ | THD < 1% | |
| Dynamic range | DR | | 57.5 | | dB | | |
| Total harmonic distortion (1kHz) | THD | | 0.3 | 1.0 | % | V _O = 10mV _{RMS} | |
| Power supply rejection ³⁾ | PSR | 16 | 20 | | dB | 0.1-10kHz | |
| Eq. EMI noise ¹⁾ | 0.9 GHz | N _{EMI0.9} | | 37 | dB MFL ⁴⁾ | Near-field measurement | |
| | 1.9 GHz | N _{EMI1.9} | | 34 | | | |
| 50 Hz suppression re 2 kHz level | dB | | 50 | | dB | | |

Notes

¹⁾ A-weighted input-referred noise voltage

²⁾ With maximum THD of 1%

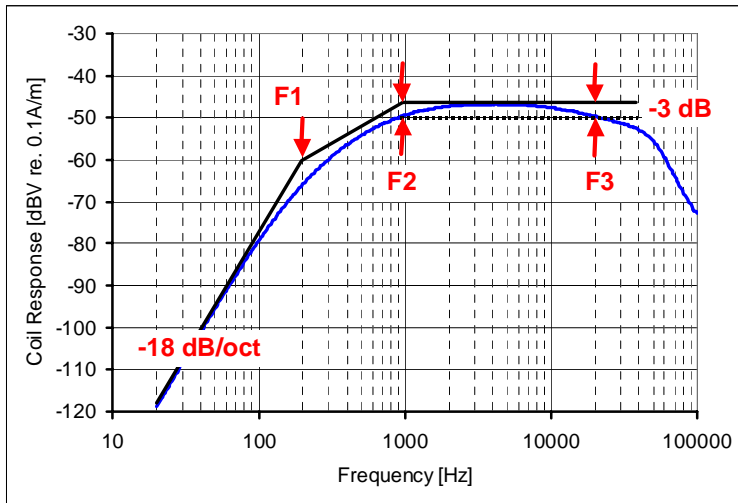
³⁾ Power supply rejection (PSR) is expressed as the maximum of inverse function of the small-signal voltage gain from the positive power supply line to the output of the amplifier in the freq. range 0.1-10kHz.

⁴⁾ 0 dB MFL (Magnetic Field Level) ≡ 0 dB SPL (70 dB SPL ≡ 100 mA/m is the typical conversation level)

0 dB MFL ≡ 31.6 µA/m = Hr

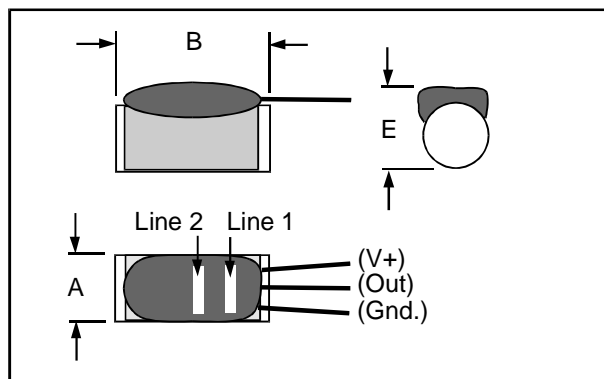
Hi [MFL] = Vo [dB re 1V] - S [dB re 1V/Am⁻¹] - Hr [dB re 1Am⁻¹] = Vo [dB re 1V] - S [dB re 1V/0.1Am⁻¹] + 70

Cutoff frequencies



Mechanical Characteristics

| Parameter | Dimensions |
|-------------|---------------------|
| A, mm (in): | 2.34 (0.092) max. |
| B, mm (in): | 4.80 (0.189) max. |
| E, mm (in): | 2.89 (0.114) max. |
| Color code | |
| Line 1: | Yellow |
| Line 2: | Blue |



Lead wires

| Parameter | Supply lead (V+) | Signal lead (Out) | Ground lead (Gnd) |
|--------------------|------------------|-------------------|-------------------|
| Diameter | 0.125 mm | 0.125 mm | 0.125 mm |
| Plating | none | none | none |
| Color | Red | Yellow | Green |
| Length* | 30 +/- 2 mm | 30 +/- 2 mm | 30 +/- 2 mm |
| Strip/tin free end | None | None | None |

* Length measured from flange.

Assembly Remarks

None