

1/4-inch Microphone Sets

Product Data

Typical Features/Applications

- Single unit comprising microphone cartridge and TEDS-enabled preamplifier
- Stability
- Plug and play
- Precision acoustic measurements

Description

IEEE 1451.4 is an emerging standard for adding plug-and-play capabilities to analogue transducers. The underlying mechanism for plug-and-play identification is the standardisation of a Transducer Electronic Data Sheet (TEDS¹). A TEDS contains the critical information needed by an instrument or measurement system to identify, characterise, interface, and properly use the signal from an analogue sensor. The TEDS resides in embedded memory, typically an EEPROM, within the analogue transducer, as defined in the IEEE 1451.4 standard.

IEEE 1451.4 defines the method of encoding TEDS information for a broad range of sensor types and applications. In order to cover such a broad range while also keeping memory usage to a minimum, the IEEE 1451.4 TEDS concept utilises the concept of templates that define the specific properties for different sensor types.

Instrumentation

Instrumentation and software to read TEDS information directly from the transducer are available, for example, from National Instruments, OROS, LMS, 01dB, etc.

TEDS Microphones

Each G.R.A.S. TEDS microphone is a combination of a TEDS-enabled preamplifier and a microphone cartridge which is sealed with a sticker. The TEDS is programmed to store the calibration information for the specific combination using IEEE 1451.4



Fig. 1 1/4" TEDS microphones:
Upper: CCP type with Microdot coaxial connector.
Lower: Traditional type with 3-m cable and 7-pin LEMO connector

TEDS template number 27: microphone with built-in preamplifier.

The G.R.A.S. 1/4" TEDS microphones described in this document are a combination of various 1/4" microphone cartridges and one of the following 1/4" TEDS-enabled preamplifiers:

- Preamplifier Type 26TC with:
3-m cable and 7-pin LEMO connector, see Fig. 2
- CCP² Preamplifier Type 26CB with:
Microdot coaxial connector.

For multiple microphone-array systems with built-in TEDS, Array Microphones Types 40PH and 40PL are also available (see separate data sheets).

TEDS Communications

For preamplifiers with LEMO connector, communication to the TEDS chip is conducted as serial communication via pin 5 (Fig. 2). For CCP microphones, the signal wire is used for reading/writing TEDS information directly from the preamplifier.

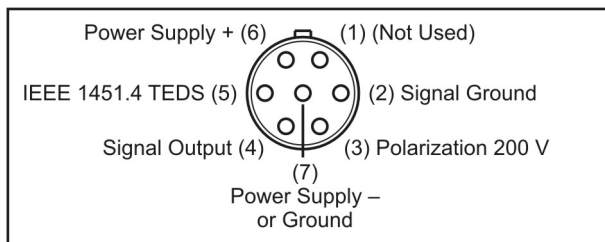


Fig. 2 7-pin LEMO connector 1B male (ext. view)

¹ Transducer Electronic Data Sheet - according to IEEE-1451.4

² CCP (constant current power) preamplifiers; also known under other trade names such as ICP[®], Delta-tron[®], Isotron[®], IEPE and Piezotron[®].

1/4-inch Microphone Sets

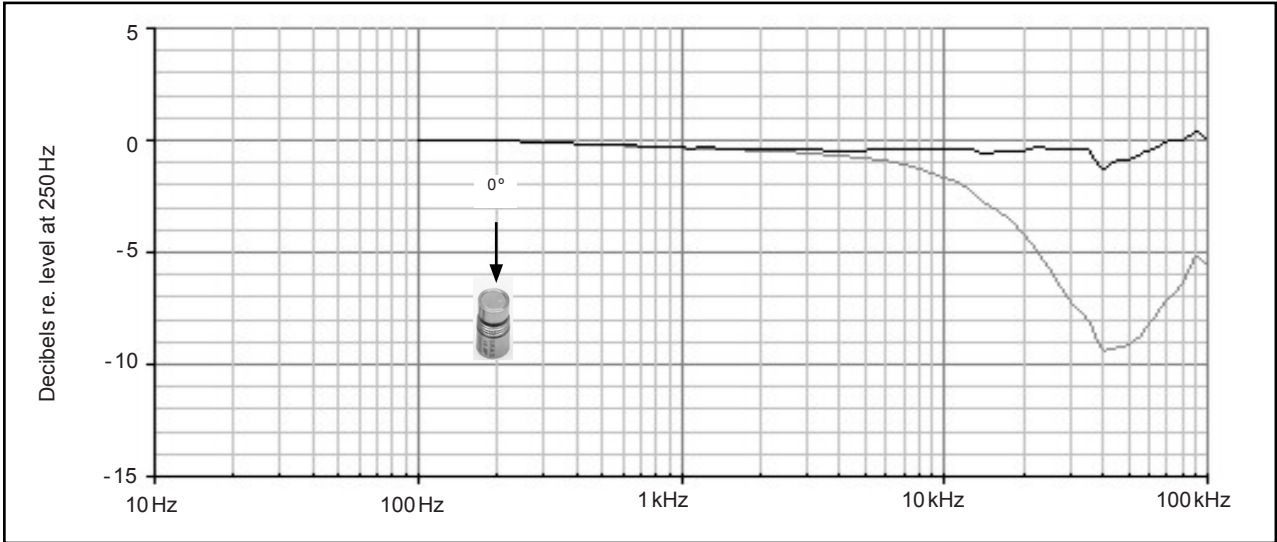


Fig. 3 Typical frequency response of Types 46BE and 46BF (without protection grid). Upper curve shows free-field response for 0°, lower curve shows pressure response.

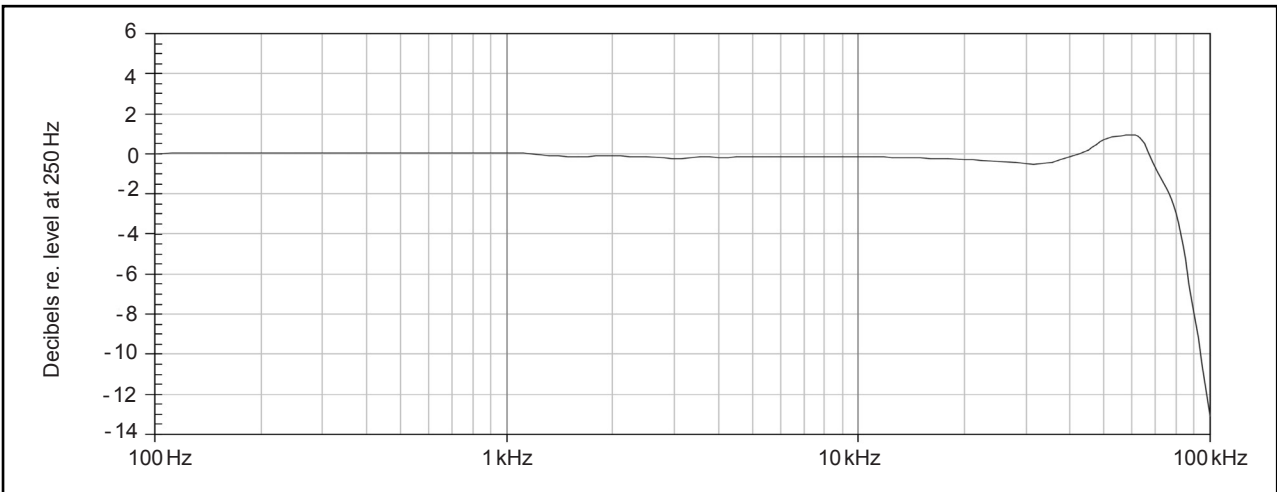


Fig. 4 Typical pressure frequency response for Types 46BD and 46BP (without protection grid)

1/4-inch Microphone Sets

Specifications Type 46BF (free-field response)

Frequency response (see also Fig. 3): 4 Hz - 100 kHz: ±2.0 dB 10 Hz - 40 kHz: ±1.0 dB	Temperature: Operation: -40 °C to +150 °C Coefficient (250 Hz): 0.01 dB/°C
Nominal sensitivity: 4 mV/Pa	Static-pressure coefficient: -0.008 dB/kPa
Polarization voltage: 200 V	Humidity range: 0 - 100% (non condensing)
Dynamic range: Upper limit (3% dist.): 166 dB re. 20 µPa Lower limit (thermal noise): 36 dBA re. 20 µPa	Influence of humidity (250 Hz): < 0.1 dB (0 - 100%)
Output impedance: Typical: 55 Ω	Influence of axial vibration, 1 m/s²: 59 dB re. 20 µPa
Power supply: Single: 28 V (0.7 mA) to 120 V (2.5 mA) Dual: ±14 V (0.7 mA) to ±60 V (2.5 mA)	Connector: LEMO: 7-pin 1B male plug
Maximum signal-output voltage (peak): from ±10 V to ±50 V	Dimensions and weight (ex cable): Diameter: 7 mm Length: 52 mm Weight: 8.3 g With cable: 51 g

Type 46BF: A combination of 1/4" Free-field Microphone Type 40BF and 1/4" Preamplifier Type 26TC with 7-pin LEMO connector (Fig. 2).

Type 46BP: A combination of 1/4" Pressure Microphone Type 40BP and 1/4" Preamplifier Type 26TC with 7-pin LEMO connector (Fig. 2).

Specifications Type 46BP (pressure response)

Frequency response (see also Fig. 4): 4 Hz - 70 kHz: ±2.0 dB 10 Hz - 25 kHz: ±1.0 dB	Temperature: Operation: -40 °C to +150 °C Coefficient (250 Hz): 0.01 dB/°C
Nominal sensitivity: 1.6 mV/Pa	Static-pressure coefficient: -0.008 dB/kPa
Polarization voltage: 200 V	Humidity range: 0 - 100% (non condensing)
Dynamic range: Upper limit (3% dist.): 174 dB re. 20 µPa Lower limit (thermal noise): 44 dBA re. 20 µPa	Influence of humidity (250 Hz): < 0.1 dB (0 - 100%)
Output impedance: Typical: 55 Ω	Influence of axial vibration, 1 m/s²: 59 dB re. 20 µPa
Power supply: Single: 28 V (0.7 mA) to 120 V (2.5 mA) Dual: ±14 V (0.7 mA) to ±60 V (2.5 mA)	Connector: LEMO: 7-pin 1B male plug
Maximum signal-output voltage (peak): from ±10 V to ±50 V	Dimensions and weight: Diameter: 7 mm Length: 52 mm Weight: 8.3 g With cable: 51 g

1/4-inch Microphone Sets

Specifications Type 46BE (free-field response)

Frequency response (see also Fig. 3): 10 Hz - 40 kHz: ± 1 dB 4 Hz - 80/100 kHz: $\pm 2/\pm 3$ dB	Temperature: Operation: -30°C to $+70^{\circ}\text{C}$ Storage: -40°C to $+85^{\circ}\text{C}$ Coefficient (250 Hz): $0.01 \text{ dB}/^{\circ}\text{C}$ (-10°C to $+50^{\circ}\text{C}$)
Nominal sensitivity: 4 mV/Pa	Relative humidity: Operation: 0 to 95 % Storage: 0 to 95 % Influence (250 Hz): <0.1 dB
Polarization voltage: 0 V	Static-pressure coefficient: -0.008 dB/kPa
Dynamic range: Upper limit: 157 dB re. $20 \mu\text{Pa}$ Lower limit: 36 dBA re. $20 \mu\text{Pa}$	Influence of axial vibration, 1 m/s^2: 59 dB re. $20 \mu\text{Pa}$
Output impedance: Typical: $<50 \Omega$	Connector: Microdot: Co-axial
Power-supply: 2 mA to 20 mA (typically 4 mA)	Dimensions and weight: Diameter: 6.9 mm Length: 53 mm Weight: 8 g
Maximum signal-output voltage (peak): $\pm 8.0 \text{ V}$	

Type 46BD: A combination of 1/4" Pre-polarized Pressure Microphone Type 40BD and 1/4" CCP Preamplifier Type 26CB with Microdot co-axial connector.

Type 46BE: A combination of 1/4" Pre-polarized Free-field Microphone Type 40BE and 1/4" CCP Preamplifier Type 26CB with Microdot co-axial connector.

Specifications Type 46BD (pressure response)

Frequency response (see also Fig. 4): 10 Hz - 25 kHz: ± 1.0 dB 4 Hz - 70 kHz: ± 2.0 dB	Temperature: Operation: -30°C to $+70^{\circ}\text{C}$ Storage: -40°C to $+85^{\circ}\text{C}$ Coefficient (250 Hz): $-0.01 \text{ dB}/^{\circ}\text{C}$ (-10°C to $+50^{\circ}\text{C}$)
Nominal sensitivity: 1.6 mV/Pa	Relative humidity: Operation: 0 to 95 % Storage: 0 to 95 % Influence (250 Hz): <0.1 dB
Polarization voltage: 0 V	Static-pressure coefficient: -0.008 dB/kPa
Dynamic range: Upper limit: 165 dB re. $20 \mu\text{Pa}$ Lower limit: 44 dBA re. $20 \mu\text{Pa}$	Influence of axial vibration, 1 m/s^2: 55 dB re. $20 \mu\text{Pa}$
Output impedance: Typical: $<50 \Omega$	Connector: Microdot: Co-axial
Power-supply: 2 mA to 20 mA (typically 4 mA)	Dimensions and weight: Diameter: 6.9 mm Length: 53 mm Weight: 8 g
Maximum signal-output voltage (peak): $\pm 8.0 \text{ V}$	

Optional Accessory for Type 46BD

1/4" TEDS Pressure-field
Microphone with SMB Connector: Type 46BD-S1

G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice.