Model BETA 87C™ User Guide

BETA 87C™
Cardioid Condenser Microphone

The Shure BETA 87C is a high output condenser microphone that provides touring professionals with studio-quality sound. Vocalists who use earphone monitor systems such as the Shure PSM® Personal Monitor System will appreciate how effectively the BETA 87C rejects ambient sound from the rear of the microphone.

The BETA 87C maintains its cardioid pattern throughout its frequency range, ensuring maximum isolation from other sound sources and high gain before feedback. Its warm, natural sound is the result of an exceptionally smooth frequency response that includes a slight presence rise. A controlled low-frequency roll-off compensates for proximity effect and prevents the “boomy“ sound often associated with close-up use.

The BETA 87C is an excellent choice for professional studio recording, yet it is built to withstand the rigors of touring. It maintains its performance characteristics even at sound pressure levels as high as 139 dB SPL. Plus, the cartridge is protected by a proven shock mount system. A hardened steel mesh grille with a built-in pop filter provides added protection.

Features:

- *Smooth, wide frequency response with slight presence rise*
- *Cardioid polar pattern for maximum isolation*
- *Minimal off-axis tone coloration*
- *Superior gain before feedback*
- *Low-frequency roll-off compensates for proximity effect*
- *Wide dynamic range (117 dB)*
- *Low distortion characteristics*
- *Very low susceptibility to RFI and electromagnetic hum*
- *Advanced cartridge shock-mount system absorbs mechanical shocks and reduces handling noise*
- *Built-in pop filter reduces wind and breath sounds*
- *Shure ruggedness and reliability for years of trouble-free performance*

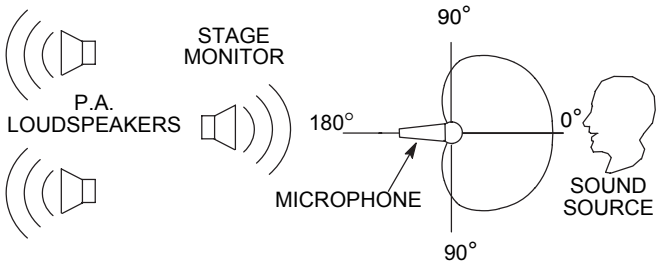
APPLICATION AND PLACEMENT

The BETA 87C is ideal for applications where earphone monitor systems such as the Shure PSM® personal monitor systems are used. Tone quality will vary, depending on how close the microphone is to the sound source. Keep in mind that microphone technique is largely a matter of personal taste—there is no one “correct” microphone position.

SUGGESTED MICROPHONE PLACEMENT	TONE QUALITY
Lips less than 15 cm (6 in.) away or touching the windscreen, on axis to microphone.	Robust sound, emphasized bass, maximum isolation from other sources.
15 to 60 cm (6 in. to 2 ft.) away from mouth, just above nose height.	Reduced bass.
More than 60 cm (2 ft.) away.	Thinner, distant sound; noticeable levels of ambient noise.

General Rules for Microphone Use

1. Aim the microphone toward the desired sound source and away from unwanted sources. Refer to Figure 1.
2. Place the microphone as close as practical to the desired sound source. For extra bass response, work close to the microphone. Refer to the table above.
3. Use only one microphone for each sound source.
4. Keep the distance between microphones at least three times the distance from each source to its microphone.
5. Place microphones as far as possible from reflective surfaces.
6. Use the fewest number of microphones as is practical.
7. Add a windscreen when using the microphone outdoors.
8. Avoid excessive handling to minimize pick up of mechanical noise and vibration.
9. Do not cover any part of the grille with your hand.



CARDIOID MICROPHONE POSITIONING
FIGURE 1

OPERATION

Power

The BETA 87C requires phantom power. This may be supplied to the microphone from an external power supply (such as the Shure model PS1A) or directly from preamplifiers, mixers, or consoles with built-in phantom power. Suitable sources should provide 11 to 52 Vdc phantom voltage.

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Proximity Effect

Unidirectional microphones such as the BETA 87C progressively boost bass frequencies by 10 to 15 dB at 100 Hz when the microphone is at a distance of about 6 mm (1/4 in.) from the sound source. This phenomenon, known as proximity effect, can be used to create a warmer, more powerful sound. To prevent excessive or "boomy" low frequency sound during close-up use, the BETA 87C bass response gradually rolls off. This provides greater control and helps the user take advantage of proximity effect.

Wind Noise

The BETA 87C has an integral wind and pop filter which provides excellent protection against most wind and breath noise. Under adverse conditions, such as high winds or close proximity to a "problem" vocalist, the optional foam windscreen can be used.

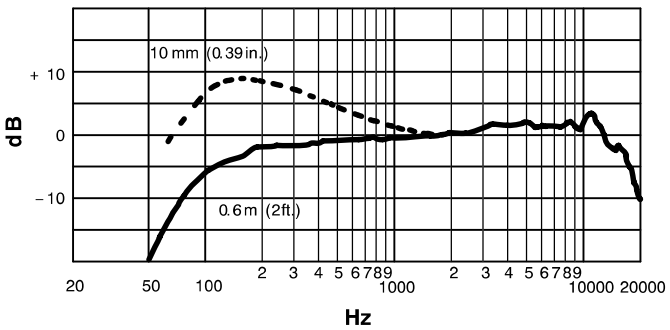
Impedance

A minimum load impedance of 800 ohms should be used for maximum signal handling and minimum distortion. The load may be as low as 150 ohms, but a reduction in output level and output clipping level will result.

SPECIFICATIONS

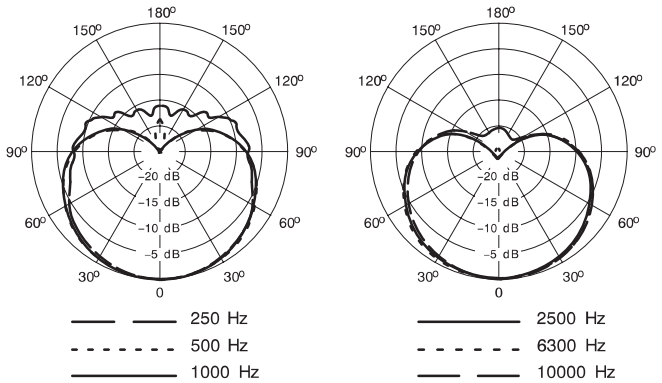
Transducer Type
Condenser (electret bias)

Frequency Response
50 to 20,000 Hz (see Figure 2)



TYPICAL FREQUENCY RESPONSE
FIGURE 2

Polar Pattern
cardioid (see Figure 3)



TYPICAL POLAR PATTERN
FIGURE 3

Output Impedance
Rated at 150 ohms (100 Ohms actual ±20%)
Recommended minimum load impedance: 800 ohms

Sensitivity (at 1,000 Hz)
Open Circuit Voltage . . . . . –51 dBV/Pa (2 mV)
(1 Pa = 94 dB SPL)

Output Clipping Level
1000 Ohm Load at 1,000 Hz . . . . . –6 dBV (0.5 V)

Maximum SPL
139 dB at 1,000 Hz (0.25% THD, 1000 Ohm load)

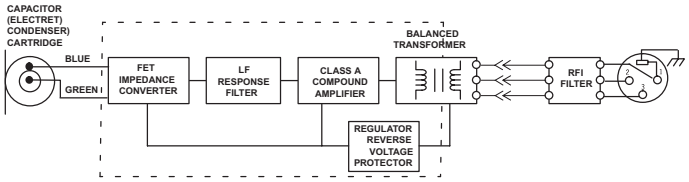
Self-Noise
22 dB typical, A-weighted
24 dB typical, weighted per DIN 45 405
(equivalent sound pressure level; measured with true rms voltmeter)

Dynamic Range
117 dB (maximum SPL to A-weighted noise level)

Hum Sensitivity
–5 dB equivalent SPL, maximum, in a 1 mOe field (60 Hz)

Signal-to-Noise Ratio
72 dB at 94 dB SPL (IEC 651)*
*S/N ratio is difference between 94 dB SPL and equivalent SPL of self-noise A-weighted.

Polarity
Positive pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of the output connector. See Figure 4.



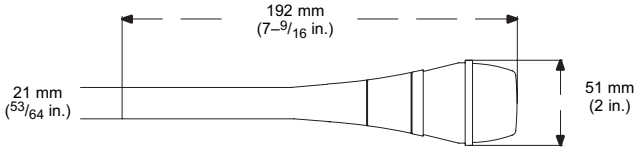
BETA 87C BLOCK DIAGRAM
FIGURE 4

Power
Phantom Supply Requirement . . . . 11 to 52 Vdc, positive at both pins 2 and 3
Current Drain. . . . . 1.0 to 1.2 mA

Connector
Three-pin (XLR) professional audio

Case
Aluminum construction with painted blue metallic finish, and hardened steel grille with nickel satin chrome plating

Dimensions
See Figure 5



OVERALL DIMENSIONS
FIGURE 5

Net Weight
Net: 207 grams (7.6 oz)
Packaged: 565 grams (1.24 lbs)

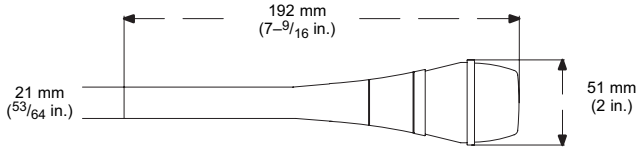
Environmental Conditions
Operating: –18° to 60° C (0° to 135° F)(relative humidity <90%)
Storage: –29° to 74° C (–20° to 165° F) (relative humidity <80%)

Involucro

In alluminio, con finitura metallica blu e griglia di acciaio temprato cromata-satinata-nichelata

Dimensioni

Vedi figura 5



DIMENSIONI TOTALI
FIGURA 5

Peso netto

Netto: 207 grammi
Imballatatto: 565 grammi

CERTIFICAZIONI

Contrassegnabile con il marchio CE. Conforme alla direttiva europea sulla compatibilità elettromagnetica 89/336/CEE. Conforme ai criteri sulle prestazioni e alle prove pertinenti specificati nella norma europea EN 55103 (1996) parti 1 e 2, per ambienti residenziali (E1) e industriali leggeri (E2).

ACCESSORI IN DOTAZIONE

Sostegno girevole A25D
Custodia (adatta anche per il trasporto)..... 26B21

ACCESSORI IN OPZIONE

Alimentatore phantom PS1A
Supporto antivibrazioni A55M, A55HM
Antivento A85WS
Cavo da 7,6 m.....C25F

PARTI DI RICAMBIO

Griglia..... RK312
Cartucci.....RPM118
Gruppo amplificatore di ricambio 90KF2600