PowerMatch® PM8250 / PM8250N
configurable power amplifier

TECHNICAL DATA SHEET

Product Overview

The Bose® PowerMatch PM8250 configurable professional power amplifier provides concert-quality sound with a high level of scalability and configurability. The PM8250 offers multiple channel and power options, an integrated audio DSP, front panel interface and USB connection. Ethernet-equipped versions enable network configuration, control and monitoring. An expansion slot supports inputs from optional digital accessory cards. PowerMatch amplifiers utilize numerous Bose technologies to deliver an unprecedented combination of performance, efficiency and ease of installation—all in a reliable, proprietary design. Available in two versions, the PM8250 provides USB connection for single-unit setup and control using Bose ControlSpace® V3.0 or higher software. The PM8250N adds Ethernet connectivity for network control and monitoring of multiple “N” version amplifiers.

Applications

Designed for a wide range of applications, including:

- Houses of worship
- Retail stores
- Atriums and malls
- Restaurants
- Auxiliary zones
- Conference centers
- Hospitality venues

Key Features

- **QuadBridge™ Technology –** Allows each 4-channel loudspeaker block to be configured as Mono, V-Bridge, I-Share or Quad modes, allowing the total available power of the amplifier block to be allocated to one or more output channels. The amplifier is capable of driving both low impedance and 70/100V loudspeaker loads directly.
- **Bose® ControlSpace® Designer™ software –** PowerMatch amplifiers can be fully configured using ControlSpace Designer software via the onboard front panel USB connection, or the rear panel Ethernet connection (network models only). Using ControlSpace Designer software you can access additional features including: Parametric EQ stages, load sweep of each output channel and auto standby. ControlSpace Designer software is also used to integrate network model PowerMatch amplifiers into larger control and monitoring systems comprised of Bose ESP processors and CC control centers.
- **Auto-Standby/Auto-Wake function –** When enabled, this function automatically enters/exits Standby Mode, allowing the system to consume less power.
- **Dual voltage and current feedback loop –** Proprietary design combines Class-D efficiency with a unique current and voltage feedback loop circuit that continuously monitors and controls both the current and voltage delivered to the loudspeaker load. Independent of power level and load impedance, the amplifier consistently delivers the widest possible dynamic range, frequency response and lowest possible distortion.
- **PeakBank™ power supply –** Regenerative 4-quadrant power supply enables higher power density while allowing the re-use of energy from reactive loads that is normally wasted in conventional Class-D designs. This highly efficient amplifier design delivers sustainable and repeatable low frequency response.
- **Fast-tracking power factor correction (PFC) –** Efficiently manages the current drawn from the AC mains, allowing the amplifier to drive loudspeakers to maximum output longer without power fluctuation. PFC provides superior transient response and functions at peak burst power much longer than conventional Class-D amplifier designs to satisfy the requirements of even the most demanding program material.

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Technical Specifications

THD for Power Rating, Typical	< 0.1 %	< 0.1 %	< 0.1 %	1 %	1 %
Mono Mode	250 W	250 W	250 W	See footnote 3	See footnote 3
V-Bridge Mode	250 W[2]	500 W	500 W	400 W	500 W
I-Share Mode	500 W	250 W[2]	150 W[2]	Not available	Not available
Quad Mode	1000 W[2]	1000 W	500 W[2]	800 W	1000 W
Maximum Rated Power	2000 W (250 W x 8 channels at 4 ohms)				
Peak Output Voltage	71 / 142 V (Mono / V-Bridge, I-Share, and Quad modes)				
Voltage Gain	30 / 33 / 30 / 33 dB (Mono / V-Bridge / I-Share / Quad modes)				
Frequency Response	20 Hz - 20 kHz (at 1 W and +/- 0.5 dB)				
Signal-to-Noise Ratio, Analog Input	>99 dB (1 dB below rated power, A-weighted)				
THD	< 0.4 % (at 1 W, 20 Hz to 20 kHz)				
Intermod Distortion - SMPTE	< 0.4 % (60 Hz, 7 kHz)				
Channel Separation (Crosstalk)	> 65 dB (adjacent channels, at 1 kHz)				
Damping Factor	> 1000 (10-1000 Hz, 4 ohms, at amplifier output)				
A/D and D/A Converters	48 kHz / 24-bit				
Total Latency (Analog In - Amp Out)	< 0.95 ms				
Input to Output Signal Routing	8 x 8 matrix				
Loudspeaker Presets	Bose Professional				
Input EQ	5-band PEQ (+/- 20 dB), notch, shelving, high pass, low pass				
Bandpass Filters (Crossover)	Butterworth, Bessel, or Linkwitz-Riley, up to 48 dB/octave				
Loudspeaker EQ	9-band PEQ (+/- 20 dB), shelving, high pass, low pass, 2-band RoomMatch® array EQ				
Maximum Output Delay	3 s				
Output Limiter	Peak and RMS voltage				
Input Channels	8 (balanced line level)			8	
Input Impedance	> 100 k			N/A	
Sensitivity	0, +4, +12, +24 dBu, selectable			Digital 0, -12, -20, -24 dBFS, selectable	
Maximum Input Level	+24 dBu (at 24 dBu sensitivity setting)			N/A	
Connectors, Input	3-pin Phoenix Contact® (green color part 1776168)			Card Dependent	
Output Channels	2 to 8 (configurable)				
Connectors, Output	8-pin Phoenix Contact® connectors (part 1778120), supports 10-24 AWG wire				
LED Status Indicators	Signal, limit, clip, fault				
ser Interface Controls	Mute, input sensitivity, output attenuation, EQ on/off, preset select. 240 x 64 LCD. Additional controls available w/ ControlSpace® Designer software				
Mains Voltage	100-240 V (50/60 Hz)				
Mains Circuit Recommendation	15A (120 V) or 10A (230 V)				
Mains Connector	IEC 60320-C14 (Inlet)				
Minimum AC Line Voltage	80 V (reduced output power)				
Maximum Inrush Current	15.4 A (230 VAC, 50 Hz)				
Maximum RMS Current Draw	8 A				
Efficiency, 1/3 Rated Power	> 68 % (pink noise input signal)				
Output Stage Topology	Class-D				
Overload Protection	High temperature, DC, HF, short, voltage limiter, current limiter, inrush current, mains circuit breaker protection				
Dimensions	3.5 H x 19 W x 20.7 D (88 mm x 483 mm x 525 mm) - 2 rack space				
Net Weight	28.3 lb (12.8 kg)			Shipping Weight 34 lb (15.4 kg)	
Mounting Depth	21 (533 mm)				
Operating Temperature	32 F - 104 F (0 C - 40 C)				
Cooling System	Microprocessor-controlled, variable-speed fans, front to rear airflow				

Setup and Configuration Software	ControlSpace® Designer software V3.2 or greater
PC Interface Connection	SB (Network version adds Ethernet R 45)
Fault Notification Output	NC/NO Relay Contact (1 A, 30 VDC), 3-pin Phoenix Contact® connector (orange color part 1976010)

Footnotes:

1 Output power is measured per channel, all channels driven, using test signals at 1 kHz.
2 Configuration not recommended / not optimal.
3 Limited use available. Tap 70V loudspeakers 2x the desired power. Tap 100V loudspeakers 4x the desired power.
4 Measured at +24 dBu sensitivity unless otherwise specified.

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Architects' and Engineers' Specifications

The amplifier shall contain all solid-state circuitry, using MOSFET output devices employing Class-D topology and a current and voltage feedback loop circuit. The amplifier shall incorporate a switch-mode power supply with fast-tracking power factor correction (PFC) that will allow full-rated power from AC outlets ranging from 100 – 240 V, 50/60 Hz. The amplifier shall have an IEC 60320-C14 10/15-amp electrical power inlet and shall be equipped with a removable power supply cord. The amplifier shall include protection from shorted and open loads, general overheating, DC, high-frequency overloads, under/over voltage and internal faults.

The amplifier shall contain eight independent amplifier channels, which can be configured to allocate the 2000 watts total rated output power between 2 and 8 channels. The amplifier shall contain variable speed fans, which are automatically controlled to minimize acoustic noise. Fan airflow direction will be from the front panel to the rear panel and should not require air filtering. Rack mounting of multiple amplifiers shall be possible without extra rack spacing for ventilation. The amplifier shall be capable of continuous operation at 1/3 of rated power into 4-ohm loads, in ambient temperatures up to 104° F (40° C). The typical current draw at 1/3-rated power shall be 8.1 amps with 120 VAC and 4.1 amps with 230 VAC.

The power amplifier shall meet or exceed the following performance specifications:

- Analog input sensitivity for rated output: 0, +4, +12 and +24 dBu, user selectable
- Rated output power, per channel, with all channels driven at less than 0.1% THD, typical (1 kHz): Mono mode with up to 8 channels, 250 watts into 4 and 8 ohms. V-Bridge mode with up to 4 channels, 500 watts into 4 ohms, 8 ohms, or with 100V lines (at 1% THD), 400 watts with 70V lines (at 1% THD). I-Share mode with up to 4 channels, 500 watts into 2 ohms. Quad mode with up to 2 channels, 1000 watts into 4 ohms or with 100V lines (at 1% THD), 800 watts with 70V lines (at 1% THD)
- Frequency Response (±0.5 dB at 1 watt): 20 Hz to 20 kHz
- Signal-to-Noise Ratio (below rated power, A-weighted with +24 dBu analog input sensitivity) >99 dB
- Total Harmonic Distortion (1 watt from 20 Hz to 20 kHz): less than 0.4%
- Intermodulation Distortion (SMPTE 60 Hz and 7 kHz): less than 0.4%
- Channel Separation (adjacent channels at 1 kHz): greater than 65 dB
- Damping Factor (10 – 1000 Hz, 4 ohms): greater than 1000

The amplifier shall incorporate eight balanced analog inputs, with rear-panel mounting and utilizing 3-pin terminal block connectors. The analog inputs shall support up to +24 dBu input signals. The amplifier shall support a digital expansion slot capable of receiving 8 digital audio channels using optional digital expansion cards, available in proprietary and industry-standard protocols. The amplifier outputs shall terminate with 8-pin, high-current, terminal-block connectors, which accept 10-22 AWG cables.

The amplifier shall include digital signal processing (DSP) optimized for loudspeaker processing, with 24-bit, 48 kHz operation. The total latency (analog input to amplifier output) shall be less than 0.95 milliseconds. The fixed-block signal processing shall include the following elements for each of the eight channels: 5-band parametric input EQ, array EQ, bandpass (crossover) filters, 9-band parametric output EQ, delay, output peak and RMS-average limiter. An 8x8 matrix mixer shall be included for routing and attenuation of any input/output combination. A signal generator supporting tone, noise and sweep functions shall be included, which shall also enable the amplifier to measure, record and store automated impedance sweeps on any output channel.

The amplifier front panel shall contain a user interface with a 240 x 64 LCD primary display, with LED indicators for signal present, input clipping, output limiting and fault. Functions accessible from the front-panel interface shall include output configuration, fault logging, mute, input sensitivity selection, output attenuation, EQ on/off per channel and loudspeaker processing preset recall.

The amplifier shall contain a PC interface with a front-panel USB connection, which will allow full amplifier setup, configuration and monitoring using Bose® ControlSpace® Designer™ software (PM8250N model only). The network version amplifier shall also contain a rear-panel Ethernet interface available from an RJ45 connector to allow serial over Ethernet communications and network control/monitoring of multiple network version amplifiers when using a PC running Bose ControlSpace Designer software.

The amplifier chassis shall be constructed of steel with a durable black finish. The dimensions of the amplifier shall allow for 19-inch (483 mm) EIA standard rack mounting. The amplifier shall be 3.5 inches (2RU, 88 mm) in height, and 20.7 inches (525 mm) in depth. The amplifier shall weigh 28.3 pounds (12.8 kg).

The amplifier shall be the Bose PowerMatch® PM8250 (PM8250N) configurable professional power amplifier.

Safety and Regulatory Compliance

PowerMatch configurable professional power amplifiers comply with CE requirements, are cUL listed according to UL60065 (7th edition) and CAN/CSA C22.2 No. 60065-03; CB approved, according to IEC60065 (7th edition), including group and national differences. These models also comply with FCC Part 15B Class A, Canadian ICES-003 Class A, EN55103-1, EN55103-2, and CISPR13 requirements.

Product Codes

PowerMatch® PM8250

PowerMatch PM8250 - US	361811-1110
PowerMatch PM8250 - AU	361811-2110
PowerMatch PM8250 - JPN	361811-3110
PowerMatch PM8250 - EU	361811-4110
PowerMatch PM8250 - UK	361811-5110

PowerMatch® PM8250N (Network model)

PowerMatch PM8250N - US	361810-1110
PowerMatch PM8250N - AU	361810-2110
PowerMatch PM8250N - JPN	361810-3110
PowerMatch PM8250N - EU	361810-4110
PowerMatch PM8250N - UK	361810-5110

Expansion Cards

PowerMatch ESPLink card	349898-0110
PowerMatch Dante™ network card	359844-0020
PowerMatch CobraNet® network card	345975-0110

PowerMatch® AES3 input card	638301-0010