

# MiniPod

**MiniPod** is a high quality active loudspeaker drive system from Linea Research. It integrates a universal mains, light-weight switching power supply with an efficient sonically transparent 400W class D amplifier in a tiny cost-effective footprint.

- Advanced Linea Research Class D Technology
- Integrated Switching Power Supply
- Very Compact and Lightweight
- Networked Digital Signal Processing Option
- Experienced Engineering Support

## Ethos

In common with all Linea products, MiniPod is designed to provide a solution rather than just be a component in a system.

From the very first project concepts we considered the critical issues that would confront our customers such as physical integration, cost, serviceability, international operation and approvals.

Above all MiniPod sounds superb, and this is not just our opinion. We realise that innovative designs and production techniques are of little value if audio performance is compromised. Sonics are at the heart of Linea's philosophy. We set extremely high standards for ourselves and appreciate working with customers who do the same.



## Modern Amplifier Design

MiniPod contains a 400W RMS class D amplifier. The benefits in efficiency and power density that modern class D switching (or PWM) amplifiers have over conventional types are well known. Equally recognised is the detrimental effect on sound quality that such an approach can often bring.

To achieve top-flight performance, a 'back to basics' approach was employed. Rather than trying to invent ever more complicated schemes for getting around the inherent difficulties with class D, effort was concentrated on identifying and eliminating the problems associated with well known topologies and optimising these solutions to take advantage of modern state-of-the-art power semiconductors.

The resulting design has a short signal path and turns the limited negative feedback

inherently available in switching designs from a problem into an advantage. This directly results in clean, fast amplification that does not compromise the high efficiency of class D.

## Power Supply

The advantages of switching technology have been carried through to the power supply. Linea's team have developed an extremely efficient lightweight power supply to partner the amplifier. The design has been evolved in harmony with the amplifier section and therefore achieves an optimum match between the two, saving significant space. This holistic approach also yields some important performance benefits such as the elimination of potential sources of noise and distortion. More obvious features are also provided such as the intelligent detection of the mains supply voltage, which means that the module is suitable for global operation without requiring any reconfiguration.

## Protection Systems

Comprehensive amplifier protection systems continuously monitor all aspects of performance to ensure that the MiniPod and drivers are always working within their safe operating areas. One of the aims of these systems is to endeavour to produce an output whenever it is deemed safe to do so, even under extreme or abusive conditions.

If circumstances dictate that full power is not possible, the MiniPod module will progressively decrease the audio level while endeavouring to find a safe operating level. Muting will only occur when it is categorically unsafe to continue, at which point the unit will shut down until it is safe to deliver power again, automatically recovering in an elegant manner.

## DSP Add-On

The Limpet product from Linea Research is designed as the ideal companion for MiniPod. Limpet adds Digital Signal

Processing and Networked control for up to two Minipods. It is housed in its own tiny metal case, allowing the MiniPod and Limpet to be 'spread out' to occupy spare spaces in small cabinets.

## Small and Solid

The MiniPod is supplied as a complete, cased, ready-to-go product only requiring the addition of a mounting plate and suitable connectors to realise a loudspeaker power module capable of meeting all international safety and EMC requirements.

## Total Design & Manufacture

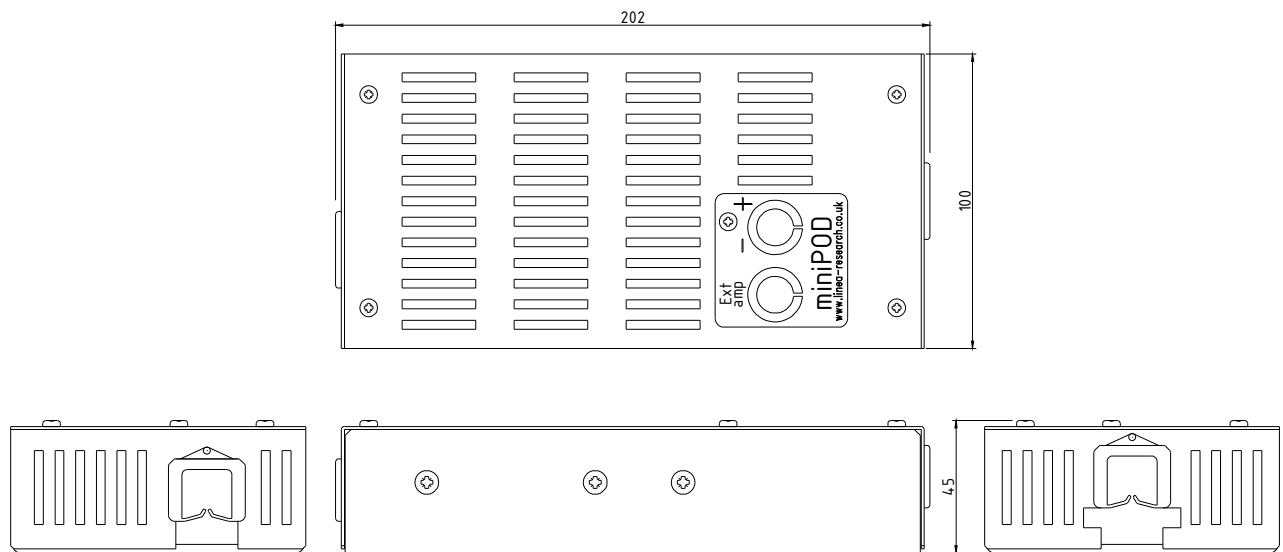
MiniPod's design is highly evolved and makes extensive use of SMT parts, this coupled with a low component count makes for excellent manufacturability which translates directly to lower costs and high reliability.

Linea's production team combine this solid engineering with state of the art production facilities and custom designed automatic test equipment to produce the products efficiently, consistently and economically.

Linea Research attaches great importance to traceability in the manufacturing process. To this end, every MiniPod and every sub-assembly inside an MiniPod has a unique bar-coded serial number. This allows the fully automated manufacturing and quality assurance tracking system to establish the precise build standard of a particular unit right down to component level.

This sort of traceability, as well as a step to achieving ISO9002 accreditation, can give customers confidence that Linea can quickly establish the history of a given module should that ever be required.

## Mechanical Detail



## System specification

Protection systems:	
Soft Clip Limiter	
Power throughput limiter & Temperature	Progressive level reduction until, mute with automatic recovery
Indicator LEDs (external)	Clip/ Limit Protect Power

## Amplifier Section

Type	High performance Class D
Number of channels	One
Output power (sine wave)	400W RMS 20Hz-20kHz driven into 8 Ohms with nominal mains. Duration limited by protection systems.
Output noise	-106dB unweighted, referenced to maximum output (22kHz BW)
Distortion (THD)	<0.05% @ 1kHz -3dB output (22kHz BW)
Frequency response	20Hz - 20kHz +0, - 0.75dB (8R Load)
Input impedance	4.7k Ohms
Signal input for clip	+5dBu
Voltage gain	32dB
Slew rate	>80V/us
Damping factor	120 ref 8 Ohms
Efficiency:	>90% typical

## Power Supply

Type	High current, high freq. switch-mode
Efficiency:	>90% typical
Input voltage:	115v / 230v nominal +/- 10%
Input voltage selection	Automatic
Mains frequency range	45 - 65Hz
Mains fuse	External
Recommended type	T6.3AT

## Other features

Inrush current limiting  
Automatic soft-start  
Automatic brownout recovery  
Automatic over-voltage protection

## Thermal

Semiconductor cooling	Conduction - through base of module to an attached panel.
Internal cooling method	Convection - mounting design should allow for airflow.

## Physical (excluding wiring)

Height	45mm
Width	100mm
Depth	202mm
Weight (no interface panel):	500g
Mounting specification:	Available as a .PDF file on request
Mains connection:	3x 1/4" spade terminals
Signal connector:	2mm 15 way connector
Amplifier output connections:	2x 1/4" spade terminals

## Accessories

Internal analog signal conditioning  
External analog signal conditioning  
External Limpet DSP.

## Regulatory

Electrical safety	EN60065
EMC Emissions	EN55103-1
EMC Immunity	EN55103-2
It also meets the requirements of UL6500 (Electrical Safety) and FCC part 15B (EMC).	

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