

Power Booster Increases Slew Rate And Bandwidth, Adds Second Channel

[Cirrus Logic](#) is expanding its Apex Precision Power booster product family with the addition of a dual-channel booster amplifier, the PB63. With a 1,000-V/ μ s slew rate and 1-MHz power bandwidth, the PB63 raises power booster performance 300 percent in terms of power bandwidth when compared to the company's previously introduced power booster products (see the table and the figure.) By pairing the economical "double booster" PB63 with one or two low-cost op amps, semiconductor and flat-panel test equipment manufacturers can now realize a combination of improved test equipment efficiency and productivity—in a more cost-optimized solution compared to traditional high-voltage amplifiers.

The PB63 features voltage operation of ± 20 V to ± 75 V (or 40 V to 150 V) and continuous output current drive capability of up to 2 A per channel. The amplifier is designed to provide both voltage and current gain when paired with a small-signal, general-purpose op amp. This approach allows the user to optimize the accuracy, offset, input noise, and settling time of the composite circuit.

"Through the PB63 booster amplifier, Cirrus Logic delivers the high-voltage performance our customers require, along with a significant speed boost, without having to turn to more expensive amplifier products to get the job done," says Greg Brennan, vice president and general manager, Cirrus Logic's Apex Precision Power business unit. "Being able to pair the PB63 with an op amp of their choosing enables a flexible, cost-effective approach that allows OEMs to tailor performance for their applications."

According to Ken Stewart, product marketing engineer for Apex Microtech products at Cirrus Logic, the PB63 was developed primarily in response to customer demands for higher slew rates and bandwidths at the same power levels as the previous power booster amplifiers. The table below illustrates these improvements as well as the tradeoffs made in output voltage swing and quiescent current to achieve these improvements.

In terms of the reduced output voltage swing associated with the PB63, this reflects the fact that smaller FETs were used in the new device as a result of several factors. "In part, we needed to use smaller FETs because some key customers asked us to pack two boosters into the same package as the PB51 (the 12 in-line SIP). But at the same time, we were asked to target a slightly different power level "sweet spot" for this device, namely a little lower voltage at 150 V and a little higher current at 2 A continuous. It was a combination of both these considerations that ultimately drove the FET selection," says Stewart.

When compared with the single-channel power boosters previously introduced and with alternative discrete solutions, the dual-channel amplifier design of the PB63 provides added value for high-density board designs. These applications include pattern generators in flat panel display inspection systems, deflection circuitry in semiconductor inspection systems, scientific scanning electron microscopes, piezoelectric drivers in printer heads for industrial ink jet printers, and programmable power supplies in semiconductor automated test equipment.

The PB63 is packaged in a 12-pin PowerSIP that affords additional savings on valuable board space, with a footprint that measures less than 1.5 square inches. It is available in sample quantities as well as volume production and is priced at \$128.94 in 1,000 quantities. An evaluation kit that includes a demo board is available. Complete product information is online at www.cirrus.com.

Table. Comparing PB63 performance with that of previously introduced power boosters from Cirrus Logic.

Parameter/Model	PB63	PB50	PB51	PB58
Output voltage swing (V)	40 to 150	60 to 200	30 to 300	30 to 300
Slew rate (V/ μ s)	1,000	50	50	50
Output current (A)	2	2	1.5	1.5
Power bandwidth	1 MHz	160 kHz	320 kHz	320 kHz
Quiescent current (standby) (mA)	20	12	12	12
Number of channels	Dual (2)	Single	Single	Single
Package type	12-pin PowerSIP	TO-3	12-pin PowerSIP	TO-3
Package size	31 mm x 30 mm	39 mm x 27 mm	31 mm x 30 mm	39 mm x 27 mm

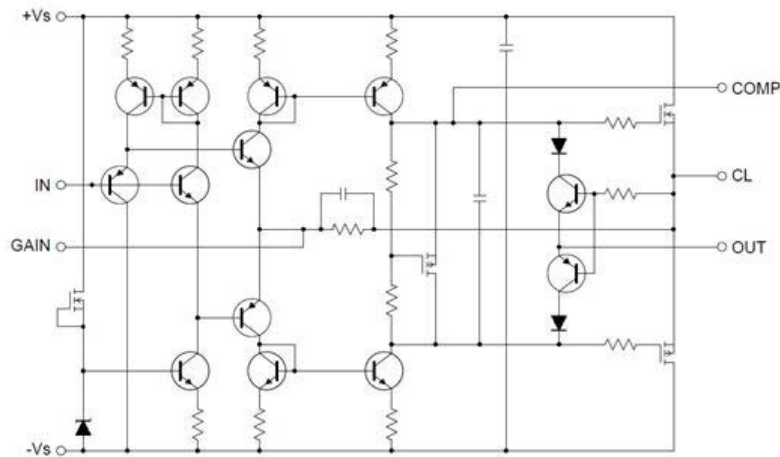


Figure. In response to customer requirements for higher slew rate and bandwidth, Cirrus Logic developed the PB63 dual-channel booster amplifier, which features a slew rate of 1000 V/ μ s and a power bandwidth of 1 MHz. An equivalent schematic for one channel is shown here along with the device's PowerSIP package.