

# CD Player Signal-Processing LSI with Built-in RF Amplifier Integrates Multifunction CMOS Equalizer and Achieves the Industry's Highest Playability

## CXD3059AR

The CXD3059AR is a single-chip CD player LSI that includes a built-in multifunction CMOS RF amplifier.

This IC achieves significant reductions in the mounting area, the number of peripheral components used, and total end product costs. The CXD3059AR also aims at increased playability in end products by improved handling of disc defects, eccentricity, and other problems. In particular, it provides an extensive set of slice level, gain, equalizer, and other adjustment functions to resolve all these playback problems.

- Multifunction CMOS equalizer
- Capable of playback from a wide range of discs, including low reflectivity discs
- Achieves the industry's highest playability
- Supports up to 4×-speed playback
- Integration on a single chip and reduced number of peripheral components

### ■ Built-in Multifunction CMOS Equalizer

This product implements functions equivalent to earlier bipolar RF amplifiers and integrates them on a single-chip. A fourth-order Bessel function was adopted as the RF system equalizer transmission coefficient, allowing this product to achieve performance not available in products from other manufacturers. The waveshaping of the 3T component is performed particularly well by this RF system.

### ■ Playback from a Wide Range of Discs, Including Low Reflectivity Discs

In earlier bipolar products such as the CXA2647, there were two CD-RW gain settings. However, this device provides eight setting levels so that the reflectivity of the disc can be matched closely. Since it also includes an offset elimination circuit, it can extract clean RF signals from low reflectivity discs requiring a high gain setting.

### ■ Achieves the Industry's Highest Playability

The term playability refers to a player's ability to achieve good playback even for discs with defects or eccentricity, or for disc on which the quality of the recorded RF signal has degraded. Since improved playability has become an important issue for CD players this product includes a full complement of functions that can contribute to resolving this problem.

### ■ Supports up to 4×-Speed Playback

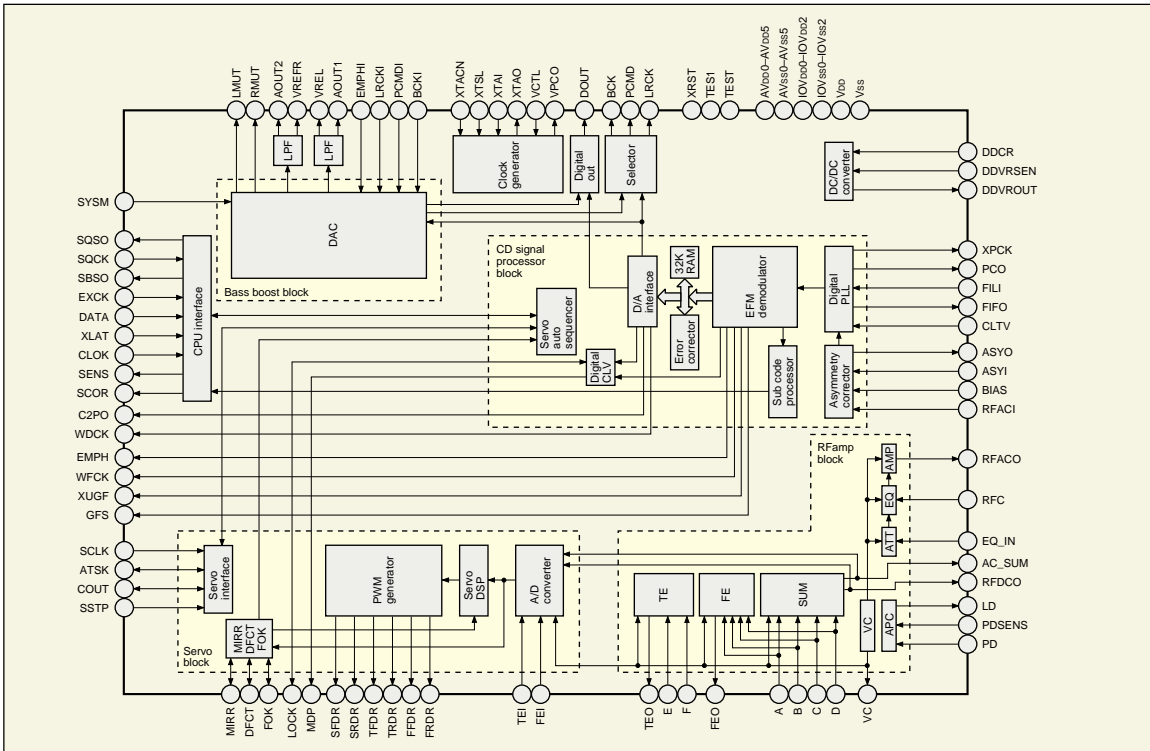
This IC achieves 4×-speed playback by integrating a CMOS equalizer on the same chip for the first time in an IC of this type. This IC allows the cutoff frequency  $f_0$  to be adjusted and the playback speed to be set (to 1×, 2×, or 4× speed) under micro-computer control without the need for additional external components. These functions also support jitter optimization and adjustment to minimize the error rate.

### ■ Integration on a Single Chip and Reduced Number of Peripheral Components

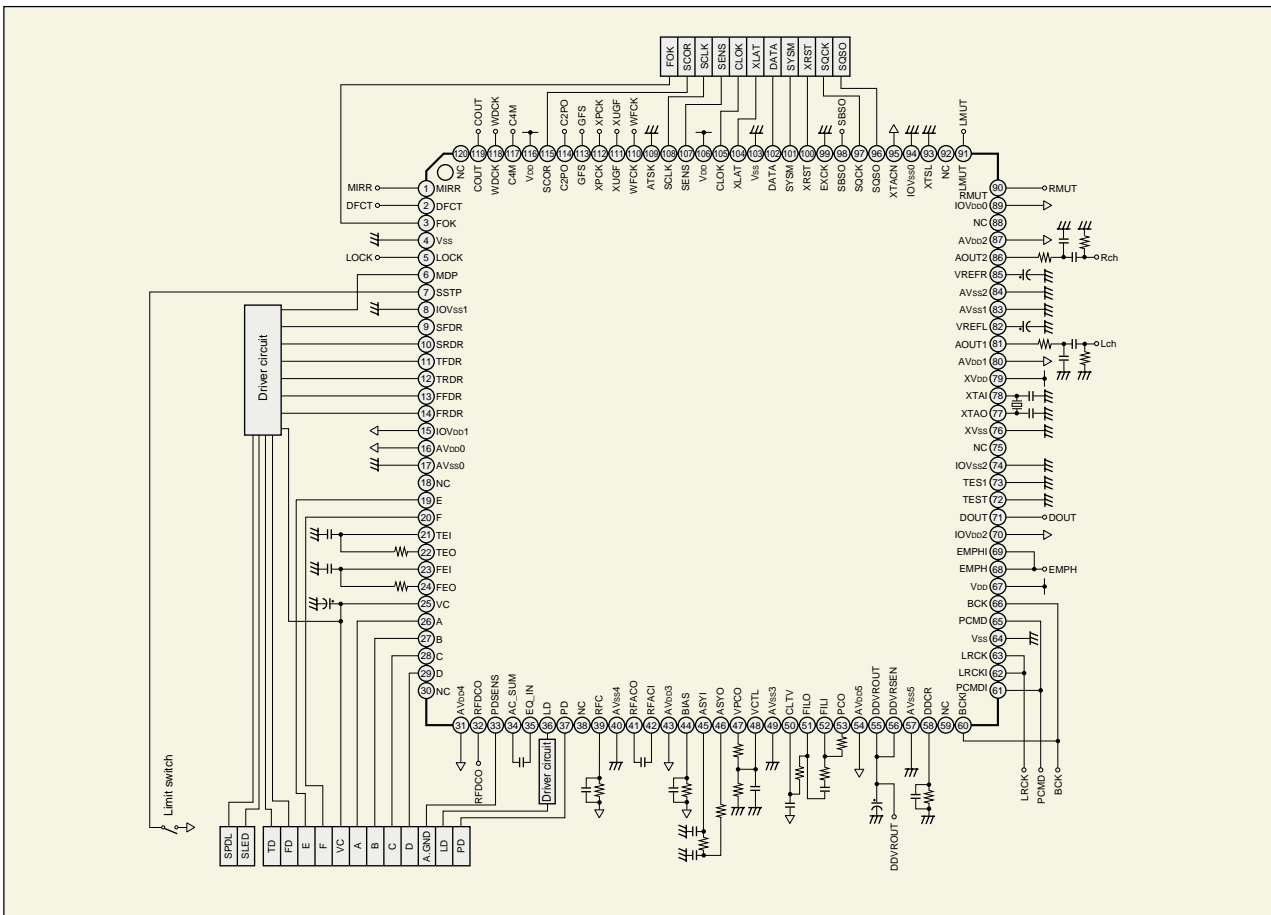
Although the RF amplifier and D/A converters have been implemented on separate chips until now, the CXD3059AR implements these on a single-chip and achieves a significant reduction in the mounting area by reducing the number of peripheral components. This also has advantages from a total cost standpoint, making this device optimal for CD players with strict cost requirements.

## V O I C E

Although development took a long time due to the incorporation of so many functions, we overcame the many difficulties we faced and were able to create the desired CD DSP with built-in RF circuits. In integrating the RF circuits on the same chip, we included a large number of adjustment functions so that users can use the RF circuits with optimal disc settings. Give this IC a try with your favorite settings!



■ **Figure 1 Block Diagram**



■ **Figure 2 Application Circuit Example**