Dual Laser Driver Supports CD and DVD for Super-Combo Drives

CXA2640ER

The CXA2640ER was developed as a single-function laser driver for high linear velocity dual drive system that adopts an architecture used in conventional CD-R/RW drives.
This makes design of high linear velocity dual drive system easier and realizes the miniaturization of the pickup.

- **CD system maximum drive current: 300 mA**
- **DVD system maximum drive current: 250 mA**
- **Rise/fall time: 1 ns**
- **Low read channel noise: 1.5 nA/√Hz**
- **High-frequency modulator frequency precision: Better than ±10%**
- **Support for a wide range of timing signals**

Achievement of Both Higher Output and Higher Speed

While increases in both the output transient waveform speed and the maximum output drive current are required to achieve higher linear velocities, increasing the maximum output drive current requires increasing the size of the output transistors, and this leads to delays of the output transient waveform.
The CXA2640ER makes ×4-speed DVD recording possible, first by providing the ability to supply the required maximum output drive currents under severe conditions for both CD and DVD as follows:

- CD system maximum drive current: 300 mA (See figure 1.)
  (VCC = 4.5 V, VOP = 2.5 V, T = 150°C)
- DVD system maximum drive current: 250 mA (See figure 2.)
  (VCC = 4.5 V, VOP = 3 V, T = 150°C),

and second, by optimizing the output transient waveform with an internal waveform shaping circuit to be both high speed and to have minimal overshoot.

Low Read Channel Noise

To achieve the signal-to-noise ratio required for high linear velocities, Sony adopted thoroughgoing low-noise design technique in this IC to achieve the low noise level of 1.5 nA/√Hz (at 20 MHz, 35 mA, 40 mAp-p), which is –6 dB lower than conventional products.

High-Frequency Modulator Frequency Precision

In high-frequency modulator used to reduce noise during playback, interference may occur between the return light from the disc surface and the laser output light due to variations in frequency. This can aggravate noise. However the CXA2640ER reduces this noise by canceling the internal resistance dependent frequency variations generated in the VCO, which uses an emitter-coupled multivibrator. (See figure 3.)

Support for Various Timing Signals

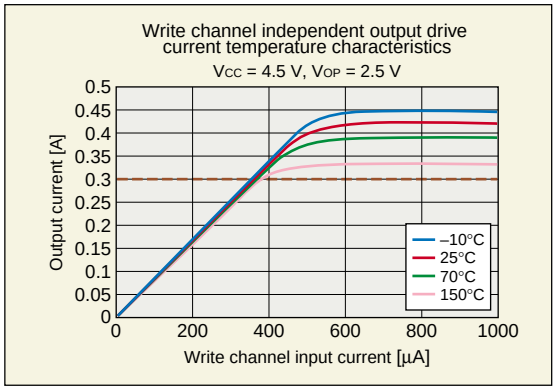
For the timing inputs, the CXA2640ER provides differential inputs (LVDS/LVPECL), which support higher speeds, and single-ended inputs (3.3 V CMOS/TTL) as well.

Miniature Package

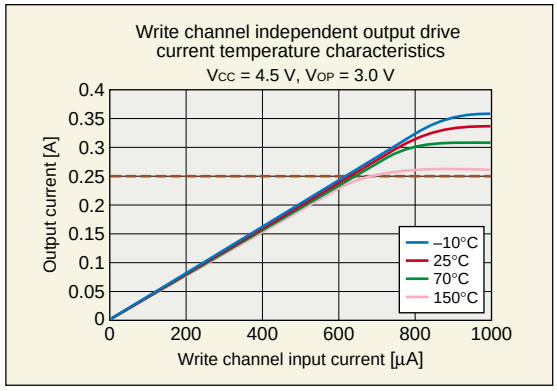
The CXA2640ER adopts a 24-pin VQFN (4 mm × 4 mm) miniature package and can contribute to pickup miniaturization due to the reduced mounting area.

V O I C E

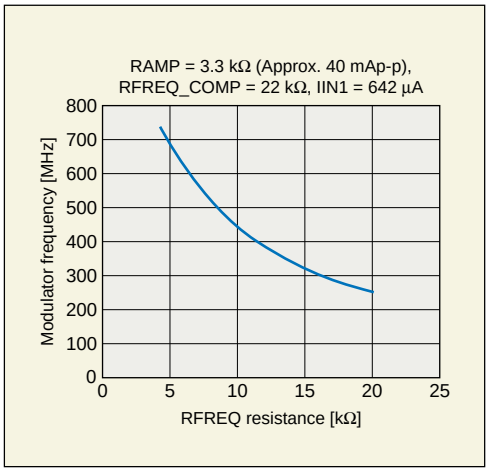
In developing the CXA2640ER, we took maximum advantage of the know-how and technologies Sony has created up to now in CD-R/RW driver development. We also developed even further refinements to create a laser driver that achieves even higher linear speeds. Thus we have full confidence in this product.



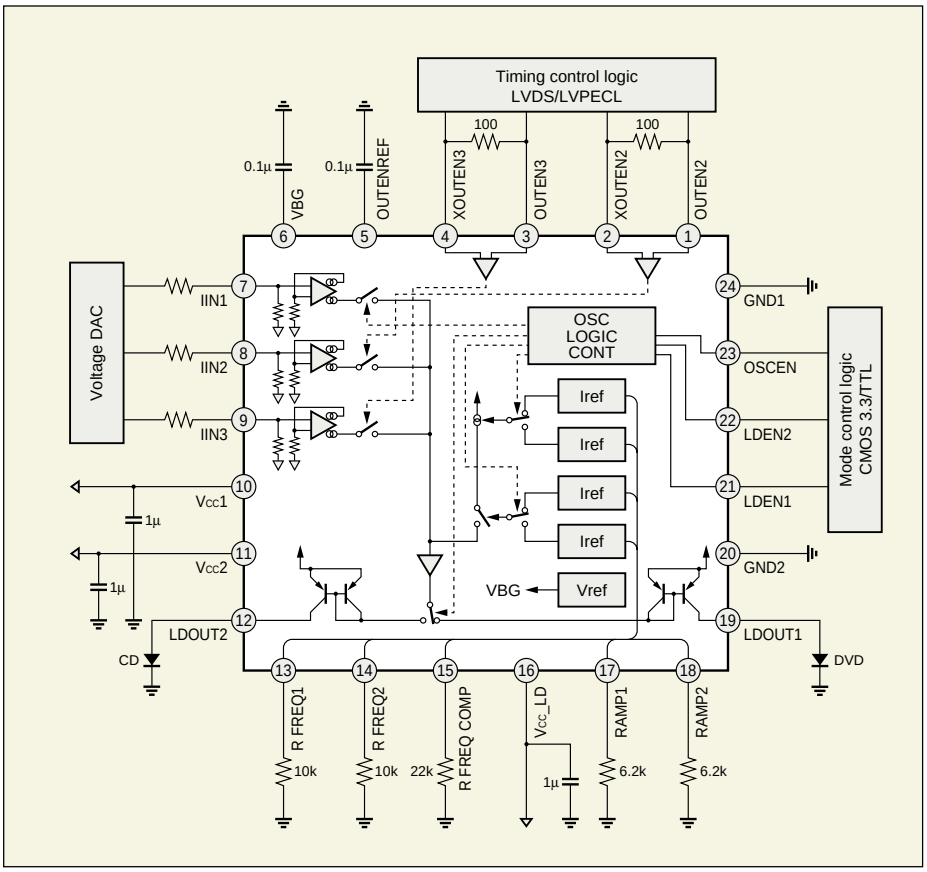
■ **Figure 1 CD Side Output Drive Current Temperature Characteristics**



■ **Figure 2 DVD Side Output Drive Current Temperature Characteristics**



■ **Figure 3 Modulator Frequency Control Characteristics**



■ **Figure 4 Application Circuit**