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## ***Application Note***

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### **AES AND S/PDIF RECOMMENDED TRANSFORMERS**

Transformers are used in professional digital audio interfaces to provide high-frequency rejection, impedance matching, DC blocking and short-circuit protection. Due to the specialized needs of this application several manufacturers have designed transformers specifically for AES and S/PDIF circuits.

The transformer used in the professional interface should be capable of operation from 3.6 to 24.6 MHz, which is the audio data rate of 28 kHz to 192 kHz after biphasemark encoding. Transformers provide isolation from ground loop, 60 Hz noise, and common mode noise and interference. One of the important considerations when choosing transformers is minimizing shunt capacitance between primary and secondary windings. The higher the shunt capacitance, the lower the isolation between primary and secondary and the more coupling that can occur for high frequency energy. This energy appears in the form of common mode noise on the receive side ground and has the potential to degrade analog performance. Therefore, shielded transformers optimized for minimum primary to secondary capacitance may be desirable.

The companies listed in the next column are a few manufacturers of digital audio transformers. Please contact these manufacturers directly for more detailed information<sup>1</sup>.

Table 1 on page 2 provides a list of transformer de-

sign and analysis papers.

**Pulse Engineering**

<http://www.pulseeng.com>

**Schott Corporation**

<http://www.schottcorp.com>

**Scientific Conversion Inc.**

<http://www.scientificconversion.com>

**VITEC**

<http://www.VitecCorp.com>

<sup>1</sup>-Cirrus Logic is unable to guarantee the performance of components manufactured by others.

<b>Manufacturer</b>	<b>Document Title</b>	<b>Document Number</b>
Pulse Engineering	<i>Understanding Common Mode Noise</i>	G019
	<i>Introduction to Transformer Magnetics</i>	G022
Scientific Conversion Inc.	<i>1998 AES paper: The Effect of Transformers on Transmission of Digital Audio Signals</i>	
	<i>2001 AES paper: Characterizing Digital Audio Transformers with Induced Jitter Histograms</i>	

**Table 1: Transformer Design and Analysis Papers**

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## Contacting Cirrus Logic Support

For all product questions and inquiries contact a Cirrus Logic Sales Representative. To find one nearest you go to [www.cirrus.com](http://www.cirrus.com)

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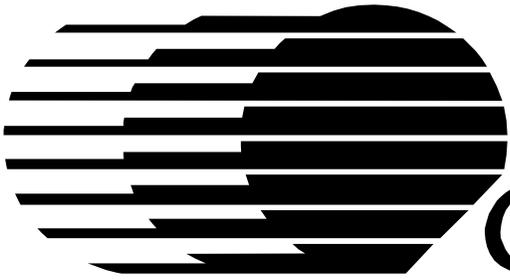
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