ESS Technology
Sabre ES9008
8 Channel DAC Performance Comparison
ESS ES9008, Competitor A, and Competitor B
SPDIF Input at 96000 bps
All tests have been conducted by an independent third party consultant.
THD+N Vs. Jitter Amplitude Wideband Random

- Competitor A
- Competitor B
- ESS ES9008
THD+N Vs. Jitter Amplitude Vs. Jitter Frequency

- THD+N (dB)
- Jitter Amplitude (nSec)
- Jitter Frequencies Tested:
  - 10 kHz
  - 3.16 kHz
  - 1 kHz
  - 316 Hz

Lines:
- Competitor A
- Competitor B
- ESS ES9008
THD+N Vs. Freq Vs. Jitter Amplitude Wideband Random

![Graph showing THD+N vs. frequency and jitter amplitudes for Competitor A, Competitor B, and ESS ES9008. The graph compares the performance across different jitter amplitudes tested (0 nS, 4 nS, 8 nS, 12 nS, 16 nS, 20 nS, 23.6 nS, 27.7 nS, 31.7 nS, 35.8 nS, 40 nS).]
DAC FFT (-60 dBFS)

**DAC DNR (dBr)**

<table>
<thead>
<tr>
<th></th>
<th>A-weighted</th>
<th>AES-17 20 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESS ES9008</td>
<td>-131.2</td>
<td>-129.0</td>
</tr>
<tr>
<td>Competitor B</td>
<td>-119.7</td>
<td>-117.1</td>
</tr>
<tr>
<td>Competitor A</td>
<td>-114.6</td>
<td>-112.2</td>
</tr>
</tbody>
</table>

**Frequency (Hz)**

Amplitude (dBr):
-200, -180, -160, -140, -120, -100, -80, -60, -40, -20, 0

**Amplitude (dBr)**
-200, -180, -160, -140, -120, -100, -80, -60, -40, -20, 0
DAC Noise Floor

Amplitude (dB)

Frequency (Hz)

-200 -190 -180 -170 -160 -150 -140 -130 -120 -110 -100

10 100 1000 10000 100000

Competitor A
Competitor B
ESS ES9008
DAC Out of Band Noise

<table>
<thead>
<tr>
<th>Frequency (Hz)</th>
<th>Amplitude (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000</td>
<td>-130</td>
</tr>
<tr>
<td>20000</td>
<td>-135</td>
</tr>
<tr>
<td>30000</td>
<td>-140</td>
</tr>
<tr>
<td>40000</td>
<td>-145</td>
</tr>
<tr>
<td>50000</td>
<td>-150</td>
</tr>
<tr>
<td>60000</td>
<td>-155</td>
</tr>
<tr>
<td>70000</td>
<td>-160</td>
</tr>
<tr>
<td>80000</td>
<td>-165</td>
</tr>
<tr>
<td>90000</td>
<td>-170</td>
</tr>
<tr>
<td>100000</td>
<td>-175</td>
</tr>
<tr>
<td>110000</td>
<td>-180</td>
</tr>
<tr>
<td>120000</td>
<td>-185</td>
</tr>
<tr>
<td>130000</td>
<td>-190</td>
</tr>
</tbody>
</table>

- Competitor A
- Competitor B
- ESS ES9008
THD+N Vs. Input Level

THD+N (dBFS) vs. Level (dB)

- Competitor A
- Competitor B
- ESS ES9008
Intermodulation Distortion

<table>
<thead>
<tr>
<th>IMD (dB)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ESS ES9008</td>
<td>-116.6</td>
</tr>
<tr>
<td>Competitor B</td>
<td>-102.1</td>
</tr>
<tr>
<td>Competitor A</td>
<td>-110.2</td>
</tr>
</tbody>
</table>

Amplitude (dB)

Frequency (Hz)
Frequency Response

Frequency (Hz)

Amplitude (dB)

Competitor A

Competitor B

ESS ES9008
Phase Vs. Frequency

-140 -120 -100 -80 -60 -40 -20 0 10 100 1000 10000 100000
Frequency (Hz)

-140 -120 -100 -80 -60 -40 -20 0
Phase (deg)

Competitor A Phase
Competitor B Phase
ESS ES9008 Phase

Frequency (Hz)
Crosstalk Vs. Frequency

-155 -150 -145 -140 -135 -130 -125 -120 -115 -110 0 5000 10000 15000 20000

Frequency (Hz)

Crosstalk (dB)

-155

Competitor A

Competitor B

ESS ES9008

Frequency (Hz)