Laser Projector for Home Theater

Description

A laser projector is a projection-type display device that uses lasers as light sources. Laser projectors are known for producing high brightness, high color purity, and excellent color reproducibility. Development of 3D display devices is gaining traction in the virtual reality market along with the active development of projectors for home and theater use. For both domestic and industrial use projectors, the internal light source becomes extremely hot, requiring fans to remove this heat. Projectors for home theaters and educational institutions run in quiet environments for long periods. With this in mind, low power consumption and low noise, in addition to high cooling performance, are required for mounted fans.

SANYO DENKI Proposal

- 9S1212H4D01 / 1 unit / axial fan / 120 x 120 x 25 mm / 12 V / lock sensor / 40,000 h @ 60°C
- 9GA0612P7G01 / 2 units / axial fan / 60 x 60 x 15mm / 12 V / PWM control function / 40,000 h @ 60°C

Purpose: Dissipate heat with fans and heat sinks near the laser (red + green + blue) light sources.
**Features**

**Silent Fan**

1. **Reduced wind noise**
   A low rated speed, along with a unique blade shape, reduced wind noise and turbulence. By reducing the size of the motor section, the opening area (donut-shaped portion) was increased to maintain airflow even with its lower speed. Also, the edge of the frame was modified to reduce wind noise.

2. **Reduced electromagnetic noise**
   Using a soft-switching method improved the motor performance and reduced electromagnetic noise.

3. **Reduced vibration**
   By increasing the number of spokes, we were able to enhance frame rigidity while decreasing secondary noise caused by vibration.

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**Merits**

**Reduced device noise**

By adopting a Silent Fan, the customer made their device quieter without sacrificing cooling performance. With less noise from the cooling fan, they were able to provide a calm and comfortable movie viewing environment.

*SPL Comparison of Conventional Fan vs. Silent Fan*

<table>
<thead>
<tr>
<th>Type</th>
<th>Model no.</th>
<th>Max. airflow [m³/min]</th>
<th>Noise [dB(A)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional fan</td>
<td>9G1212D4H01</td>
<td>2.50</td>
<td>40</td>
</tr>
<tr>
<td>Silent Fan</td>
<td>9S1212H4D01</td>
<td>2.45</td>
<td>-4 dB less 36</td>
</tr>
</tbody>
</table>

**Reduced device vibration**

A vital characteristic of laser projectors is their image quality. Even the slightest misalignment of light from the light source will affect the contrast balance and degrade the image quality. Our low-vibration Silent Fans helped improve device reliability by reducing the vibration that causes light source misalignment.