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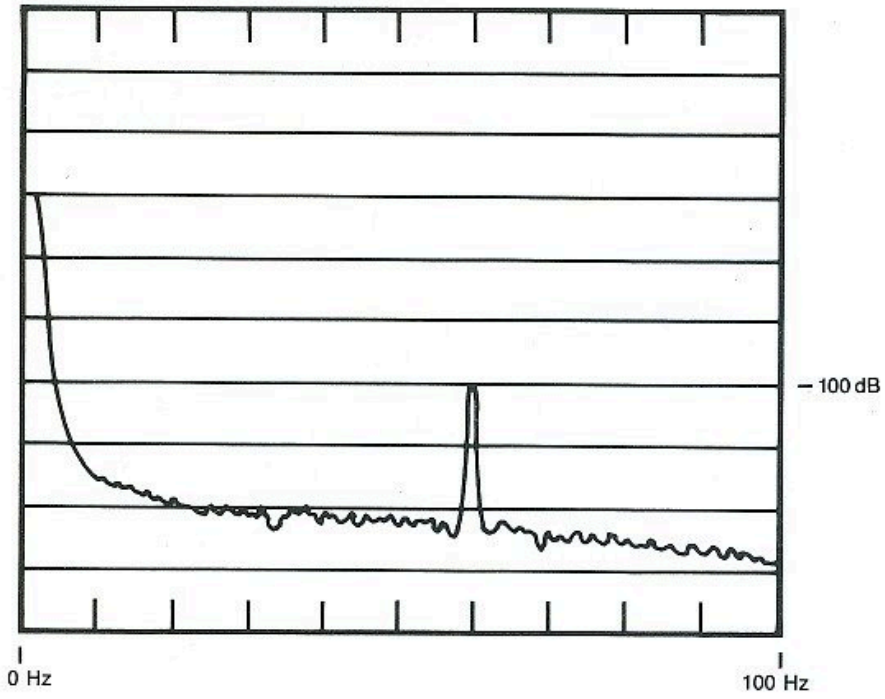


Figure 3. Typical Photocurrent Noise Spectrum, 0 to 100 Hertz.
Scale: vertical 10 dB/division, horizontal 2.5 KHz/division.

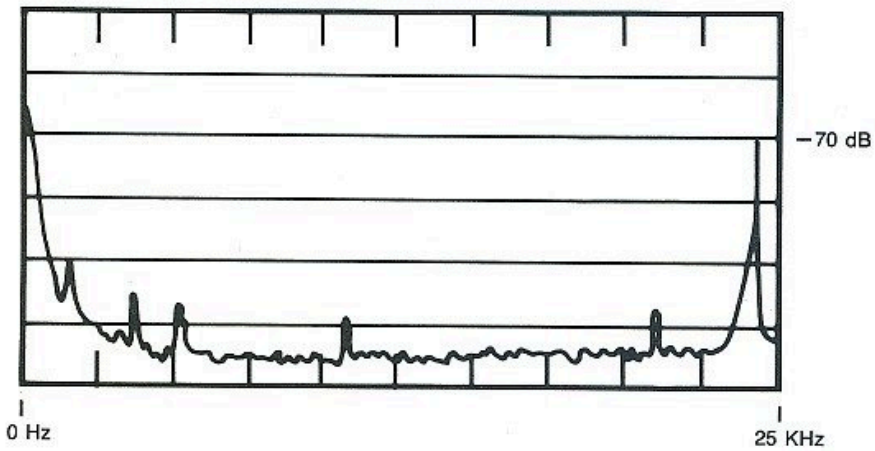


Figure 4. Typical Photocurrent Noise Spectrum,

GENERAL NOTES

Repeated Turn On:

The Model 117A operates independently of how long the laser has been operating, or how long since it was last turned off. The Model 117A will stabilize within a few megahertz of the same frequency with repeated cycling of the power.

Mounting:

The laser tube is mounted in a manner which reduces the transmission of vibrations from the outside. However, because the output frequency is strongly dependent upon the cavity length, the output is affected by vibration. In order to reduce the effects of external vibration as much as possible, it is best to mount the tube in the recommended areas.

Optical Isolation:

Some applications require an optical isolator to limit retro-reflections from the test set-up back into the laser. In some situations, it may be desirable, or even necessary, to alter the optical arrangement in order to achieve a high level of isolation. Possible techniques for reducing retro-reflections include the following:

1). Design an optical system layout which minimizes the potential for stray and scattered light to be transmitted back into the laser.
2). Clean optical surfaces to reduce scatter and reflections.
3). Employ anti-reflection coatings or place components at Brewster's angle to control or eliminate reflections.
4). Use attenuators to reduce the beam intensity—the beam is attenuated by a single pass while retro-reflections are further reduced by a second pass.

0 to 25 KHz.
Scale: vertical 10 dB/division, horizontal 2.5 KHz/division.

Noise

The Model 117A has excellent noise characteristics. Two factors contribute to noise in the 117A: The high voltage switching power supply (24 KHz) and the cavity length thermal control (5 KHz). Figure 3 shows the noise spectrum from DC to 100 Kz and Figure 4 shows the noise from DC to 25 KHz (noise measurements were made using a Spectra-Physics Model 404 power meter, 0.5 mW scale, with an external optical attenuator).

5). Misalign the axis of the laser with respect to the axis of the test set-up to cause back reflections to miss the laser.
6). Use spatial filters or apertures to prevent reentry of unwanted beams into the system.
7). Use optical isolators comprised of a polarizer and quarter wave plate to prevent specular reflections from returning to the laser.
8). Use optical isolators based on Faraday rotation and polarizers to provide effective one-way transmitting components.

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