



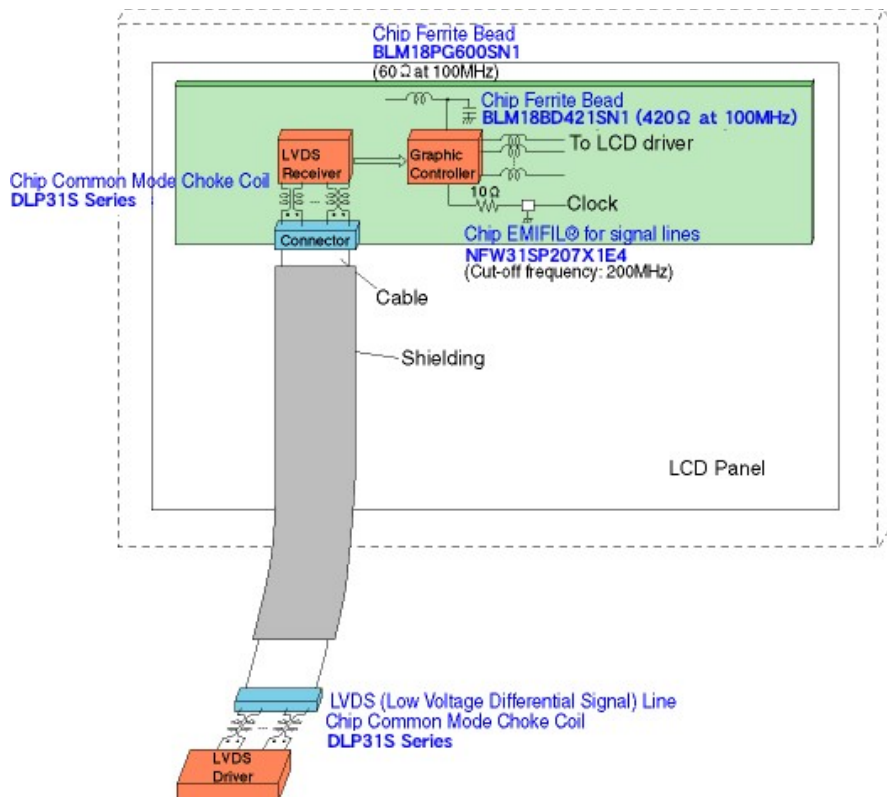
**Examples of Noise Suppression in Notebook PCs**

**Installing EMI filters in the LCD Panel**

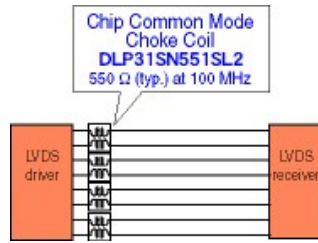
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The connection between the graphic controller and LCD driver contains many lines that switch on and off simultaneously. This switching creates instantaneous large current flows into the GND and power supply line. Therefore, it is necessary to suppress the current flow from the signal lines. The BLM Series (Chip Ferrite Bead) is typically used for this purpose. On the clock line, especially at high operating speeds and high noise levels, a filter with high and steep attenuation is used, such as the NFW31S Series (Chip "EMIFIL®" for signal lines). Noise stemming from other circuits is conducted to the connection between the LVDS driver and LVDS receiver. The DLP31S Series (Chip Common Mode Choke Coil) is used to suppress noise without adversely affecting the signal.

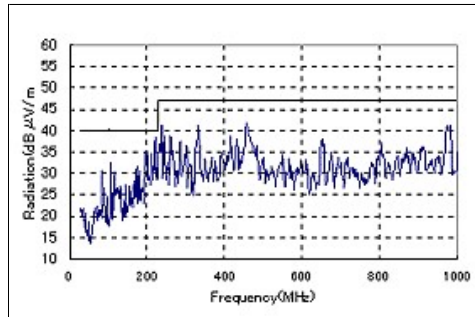
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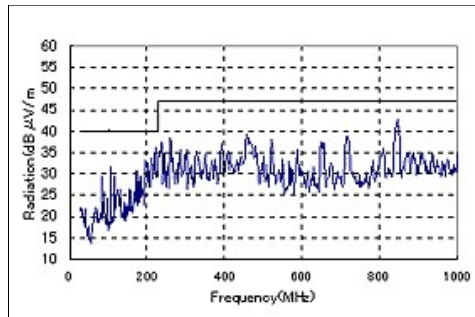
**Noise suppression between the LVDS driver and LVDS receiver using DLP31SN551SL2 (Chip Common Mode Choke Coil, 550 ohms at 100 MHz)**



Before installing the EMI filter



After installing the EMI filter



During low voltage differential signal transmission, higher harmonics of the transmitted signal are not a major source of EMI, however common mode noise is a concern. Common mode noise stemming from the LVDS driver and signal processing ICs is conducted to the LVDS signal line. Noise is then emitted by using the interface cable as an antenna.

The DLP31SN551SL2 (Common Mode Choke Coil, 550 ohms at 100 MHz) is then installed between the LVDS driver and LVDS receiver. This suppresses the noise level by approximately 2 to 3 dB in the range between 200 and 230 MHz where the noise margin is small.

For high-speed differential signals such as LVDS, only common mode noise must be eliminated without affecting the transmitted signal. Therefore, a common mode choke coil with a high coupling coefficient is required.

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