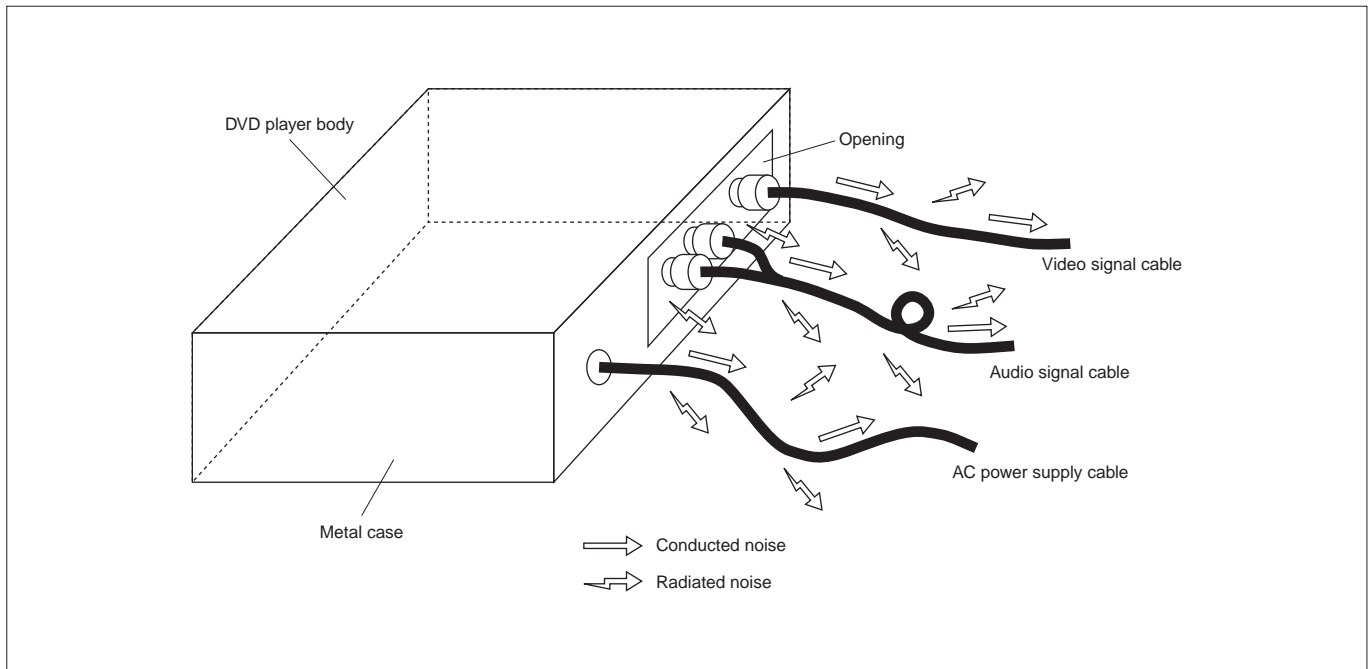


5 Example of Noise Suppression in DVD Players

Noise Emission Status :

Noise generated in the DVD player is radiated from the audio and video signal cables. In addition, although the player body is shielded with a metal case, radiated noise is emitted from the connector port openings.

A DVD player processes image signals using the MPEG2 method. Since image Processing requires high-speed signal processing, signals are transmitted at a very high speed. Therefore, high frequency noise around 1GHz, may be radiated.



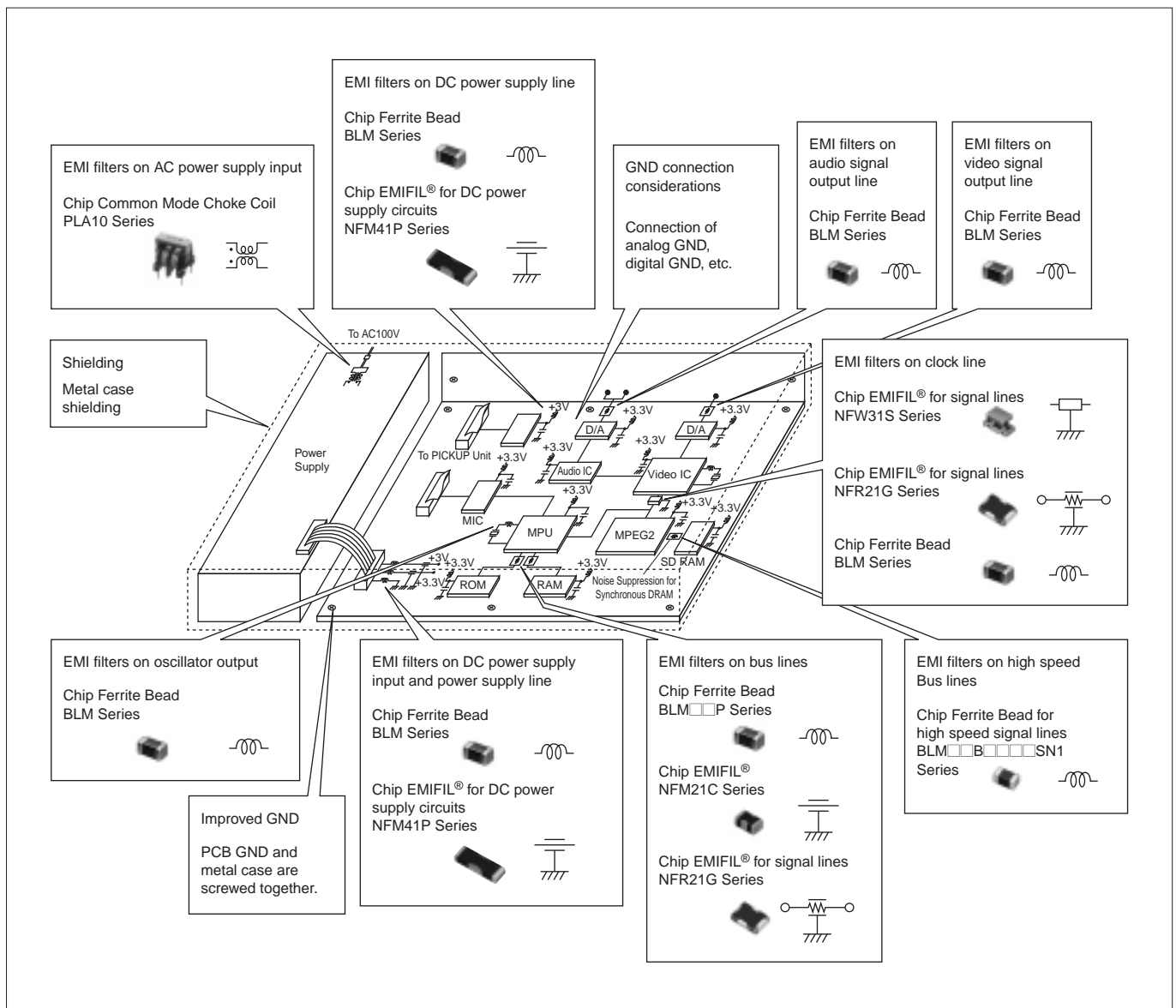
5

Example of Noise Suppression in DVD Players 5

Noise Suppression Content in DVD Players

High frequency noise radiates from the player body and cables. Therefore, the noise is suppressed by shielding the body and by installing noise filters in the cable port. However, it is necessary to carefully select noise filters because images or sounds could be deteriorated. If a high capacitance or high inductance filter is installed in the video or audio signal cable connection. In case that noise suppression in the cable

port is not enough, it is necessary to make noise suppression of the PCB by improving the GND, and by installing noise filters at noise sources. The high-speed data bus between the MPEG2 and SDRAM chips generates especially high-level noise. This noise can be suppressed by installing a BLM series (Chip Ferrite Bead) applicable for high-speed signal lines.

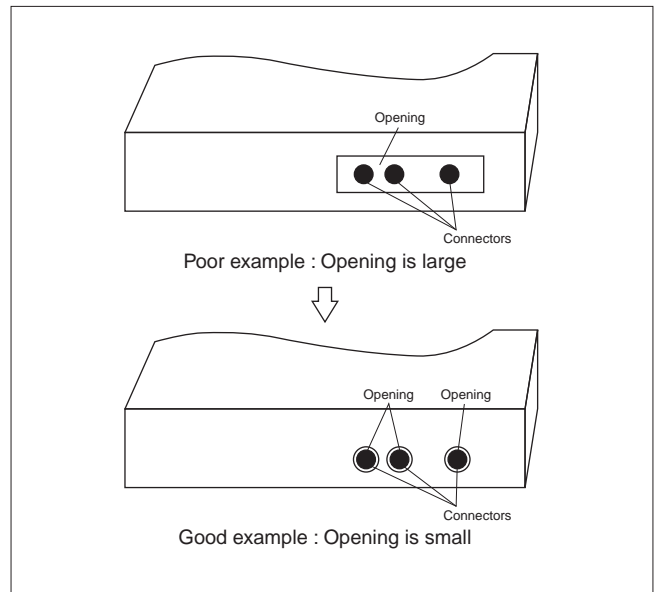


5

5 Example of Noise Suppression in DVD Players

Improving the Shielding

The size of the opening in the metal case affects the shielding effects. As the opening becomes larger, the shielding effect decreases. It is best if larger openings are divided into multiple smaller openings, making each opening as small as possible, with the objective of making the longest part of the opening as small as possible.

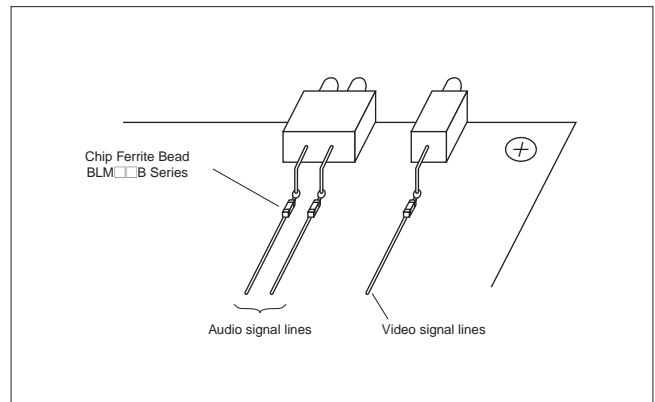


5

Installing EMI filters on Interface Cable Ports

When noise is conducted to the cable, the cable will radiate high noise levels. To suppress this noise, EMI filters are installed at the cable connection.

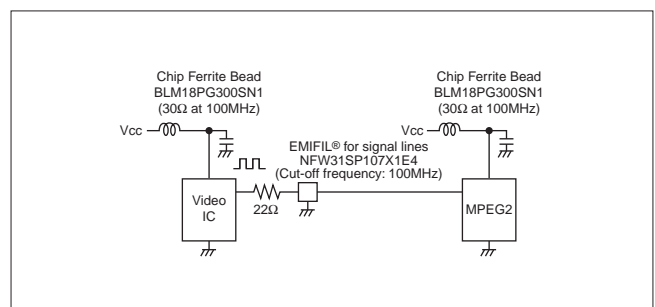
In some cases, the installed EMI filters may affect or deteriorate images or sounds. It is necessary to pay careful attention in selecting noise filters.



Installing EMI filters on the Clock Line

High frequency clock signals generate high frequency noise. Noise and signal frequencies may be close to each other. Therefore, an EMI filter with high and steep attenuation is used such as the NFW31S series (Chip EMIFIL® for signal lines), or the BLM□□B series (Chip Ferrite Bead for high-speed signal lines).

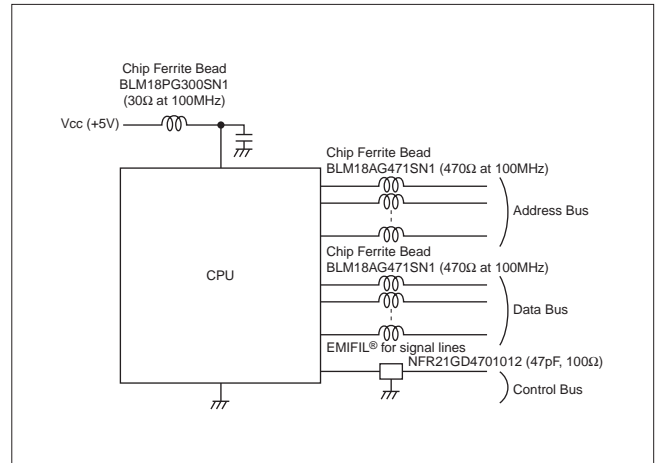
Noise caused by transient currents is also generated on the power supply line. Therefore, a chip ferrite bead is installed, as well as a by-pass capacitor, to suppress noise on the power supply line.



Example of Noise Suppression in DVD Players 5

Installing EMI Filters on Bus Lines

Data bus/Address bus lines contain many lines that switch on and off simultaneously. An instantaneous large current flows into the GND and power supply lines. Therefore, it is necessary to suppress the current flow to the signal lines. The BLM series (Chip Ferrite Bead) is generally used for this purpose. On the control bus line, especially at high operating speeds and high noise levels, a filter with resistance components is used such as the NFR21G series (Chip EMIFIL®).



Installing EMI Filters on High-speed Bus Lines

Since very high speed signals are transmitted on the bus lines between the MPEG2 and SDRAM chips, high levels of high frequency noise are generated. In these cases, the BLM□□B□□N1 series (Chip Ferrite Bead for high-speed signal lines) is used. Featuring a sharp impedance rise at the specified frequency, this filter is used to minimize distortion of the signal waveform.

