

초소형 광디스크 드라이브의 충격절연장치 설계 The design of shock isolator for small form factor optical disk drives

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ABSTRACT

Because digital and mobile devices such as PDA and mp3 player are widely used, small-sized information storage devices are needed, which supports the storage part of these devices. The small form factor optical disk drive is a strong candidate of leading storage devices. But the small form factor optical disk drive is weak in external shock. When the drive is subjected to the external shock, the pickup will crashes on the disk surface, and it can cause the damage on the pickup assembly and disk. In this research, a finite element model of small form factor optical disk drive is made in order to analyze shock response of small form factor optical disk drive. A finite element model is made by using conventional finite element analysis tool, Ansys/Js-Dyna. Shock responses are obtained using this finite element model according to various shock acceleration. And the design method of shock isolator is suggested in order to reduce the shock response of small form factor optical disk drive exposed shock environment. Small form factor optical disk drive can be modeled as a 2 DOF system. This 2 DOF model can help us to analyze the influence of absorber parameters on SFF ODD, systematically. Through the studies of the shock response in 2 DOF model, the optimal parameters of the shock isolator can be presented. Last, it is shown that adjusting the natural frequency ratio of bumper can improve the shock characteristics in finite element model.

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