

THE USE OF FERRITE IN EMI SUPPRESSION

鐵氧磁體一個最常見且最經濟效益的應用，是在一個如高速個人電腦內部一樣的電磁波干擾雜訊環境中對訊號，得以輸入及輸出的導線作濾波，舉例來說，從一中央處理器(CPU)積體電路(IC)所輻射出的能量，會如圖例十二所示一樣，與用以從系統外接的鍵盤及滑鼠傳送及接收資料"驅動"積體電路產生耦合，使得原本被侷限載具遮蔽的電腦內部的雜訊，得以藉這些設備裸露在外的導線而產生輻射，豐晶科技的鐵氧磁體可安置於此驅動積體電路和鍵盤及滑鼠的連接器之間，用以對在訊號線中的高頻中央處理器雜訊插入一很大的串連訊號阻抗，因為鍵盤及滑鼠的訊號在1MHz以上，其本質具有零訊號能量，故可在不受干擾下通過鐵氧磁體。

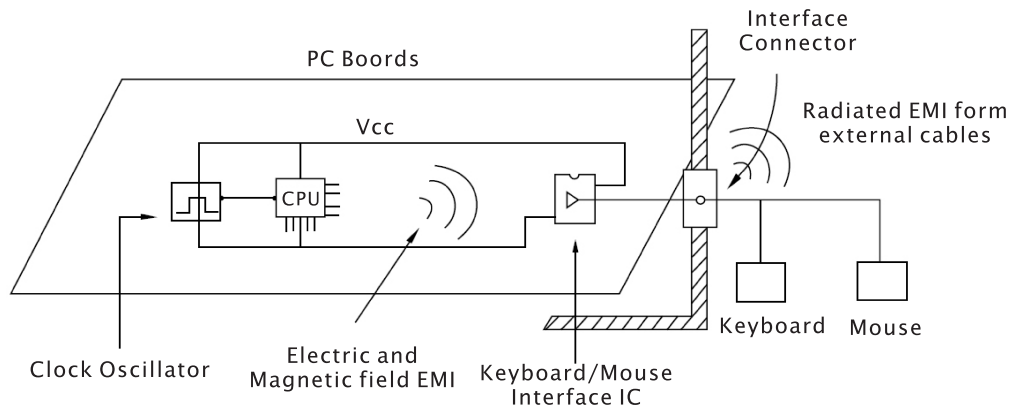


FIGURE 12: Noise coupling between high speed CPU IC and keyboard/mouse interface IC

■ Ferrites For EMI Suppression On Cables(應用於抑制電纜線電磁波干擾的鐵氧磁體)

Introduction 簡介

Internal and external cable assemblies in computer equipment often act as miniature antennas as they transform noise voltages and noise currents into large sources of radiated EMI. Gausstek line of ferrite beads for cable assemblies provide a cost effective vapproach to attenuate noise currents on flat and round cable bundles before they can be converted into radiated EMI.

在電腦設備的內接及外接電纜配件通常有如一小型天線的作用，他們將雜訊電壓及雜訊電流傳播至一大的輻射電磁波干擾源，豐晶科技的鐵氧磁體磁珠對電纜配件可提供一經濟的方式將在扁型及圓形電纜束上的雜訊電流在尚未轉化成輻射的電磁波干擾前予以減低。

Unshielded cable assemblies will radiate EMI due to the common mode noise that is present on their copper conductors. This noise is characterized by equal in phase high frequency currents that flow in the same direction along all the wires in the cables, as shown in Figure 13. These currents induce a net magnetic field with a specific magnitude and direction. Gausstek cable ferrites attenuate the noise currents by "capturing" the magnetic field and converting a portion of its energy into heat. In terms of two terminal electrical device behavior, the ferrite is said to present a large lossy impedance to the common mode current. A Gausstek core used around a group of wires is common mode choke.

未遮蔽的電纜配件，由於出現在其銅導線上的一般模式雜訊，會輻射電磁波干擾，此雜訊為一同相之高頻電流，沿著電纜中的導線方向流動。如圖例十三所示。這些電流感應出一特定方向及特定大小之磁場，豐晶科技適用於電纜之鐵氧磁體，藉由"獲取"此磁場並將其部份能量轉化成熱能之方式，以減低其雜訊電流，對一具兩端面之電器設備之行為而言，鐵氧磁體可說是一個對一般模式電流具有一很大之損耗阻抗，豐晶科技用於圍繞一群導線的鐵芯為一般模式扼流線圈。

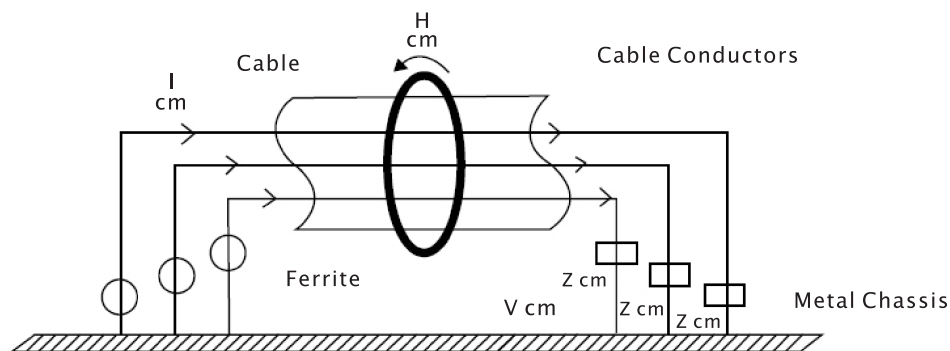


FIGURE 13: Ferrite on cable with common mode EMI

Internal Cable Assemblies(內接電纜裝配)

By reducing the EMI generated by cables inside the equipment, Gausstek ferrites can reduce the cost and amount of overall shielding required to confine EMI within a product's enclosure. Gausstek cable ferrites can be applied on internal power cables that carry direct current (DC), alternating current (AC), or analog and digital signals.

藉由減低在設備中的電纜所產生之電磁波干擾，豐晶科技的鐵氧磁體可以減少用來將電磁波干擾局限在產品內部的成本及遮蔽數量，豐晶科技用於電纜的鐵氧磁體可應用於傳導直流電流(DC)，交流電流(AC)或類比及數位訊號的內部電源電纜上。