

# Experiment Study on Performance for LISN-based Networks Applied in EMI Measurement

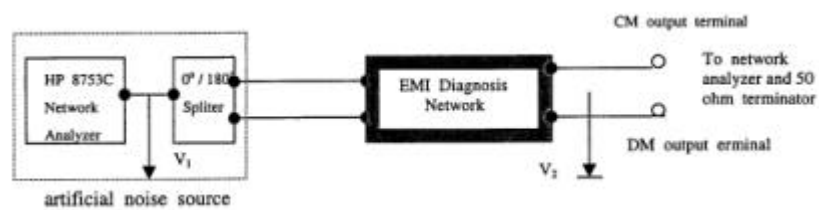
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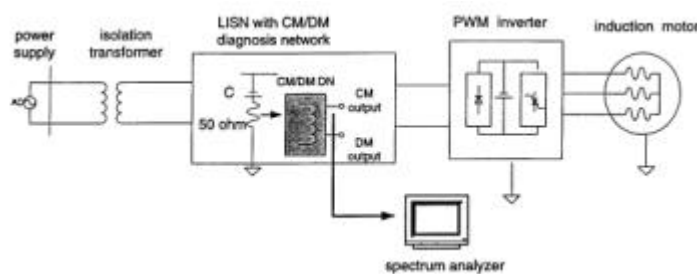
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Currently, the most common test instrument for conducted emission measurement is line impedance stabilization network (LISN). Though LISN is a specified standard EMC measurement instrument, it can only measure the total conducted EMI on the power lines but can not be utilized to detect mode currents like common-mode and different-mode current (CM/DM). Paul presented a CM/DM diagnosis network (CM/DM DN) (Paul and Hardin, IEEE Trans. MEC Vol.30, p553-560, 1988), but it can only detect single-mode EMI noise with a mechanic switch, which may bring the affects on network performance of discriminating capability at high frequency. Then See presented another network that employs two transformer with center-tapped and no switch appeared in network. (See, Electronic Letter., Vol.35, p1446-1447, 1999). Mardiguian proposed a very simple network which only use one transformer (Mardiguian, IEEE Int.Sym.EMC, Vol.2, p882-886, 1999). However up to date, no complete data can be found in hand on performance of network for those networks. In this paper, the test setup in laboratory is developed based on splitter as seen in Fig.1. By using this technique, the insertion loss and mode-rejection ability can be measured for both common-mode and differential-mode noise in easy way, and measurement data are obtained in frequency range of 10KHz ~30MHz. Hence, these networks may be compared with each other for best choice in use. Further, application example for switched mode power supply (SMPS) conductive EMI measurement is done, as illustrated in Fig.2



**Fig.1** Test setup for performance testing of CM/DM diagnosis network



**Fig.2** Conducted EMI measurement for switched-mode power supply by using CM/DM DN