

## **General Electronic Equipment Microwave Susceptibility Trend as a Function of Frequency**

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Measurements have been performed in the UK over more than a decade to determine the upset / disruption threshold of a wide range of equipment. Such information is critical to ensuring the safe operation of systems in the vicinity of High Power Microwave (HPM) fields. These measurements have been performed using a number of techniques to achieve high field levels including mode stirred chamber testing and the Orion HPM source (Spark, S. N, Kerr, B. A. Parkes, D. M. Harbour, M. I. Douglas, S. C. "The high power microwave facility: Orion," in *Proc. Inst. Elect. Eng. Symp.* 2001, pp. 13/1–13/2).

A generic upset trend is described which has been computed from an ensemble of equipment trials. The equipment trialled involves systems where the upset was due to back door coupling and not in band RF systems. The Generic trend is in general agreement with that of more specific equipment trends, and the form of these trends has been well known in hand waving fashion to the EMC community. (Richard Hoad, Nigel J. Carter, David Herke, and Stephen P. Watkins, *IEEE Transactions on Electromagnetic Compatibility*, Vol. 46, No. 3, August 2004, pp 390 - 395). The useful frequency span of such a trend may well extend to 40 GHz.

The observed trend is determined by several factors namely (a) Logic family switching threshold, (b) logic family maximum clock frequency and (c) circuit stray L and C elements together with dielectric loss in circuit board and IC packages. These factors are discussed with aim of establishing a sound interpretation of the observed susceptibilities.