

HPM – The Importance of the Frequency of Excitation

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The purpose of our HPM investigations is to find out whether development of HPM weapons is useful and/or the protection against potential HPM weapons is necessary. For that application, WIS utilized a special HPM Simulator to look for the lowest susceptibility levels of electronic systems with respect to the amplitude of the HPM Test Pulse.

Since 2002 susceptibility and damage levels of various Test Objects (TO) have been determined with this unique HPM Simulator. The TO varied by their dimensions, installed electronic, network of electronic, electromagnetic protection and their complexity of coupling paths.

The HPM Simulator of WIS generates narrow band microwave pulses with a duration of 200 up to 600 ns with frequencies in the range of about 700 MHz up to 1.5 GHz.

It will be presented, why this type of HPM-Simulator is particularly suitable for this task. For this purpose, it will be shown the dependencies of susceptibility levels on the frequency of excitation, on the amplitude of the HPM pulse and on their different signal types, too.

Further more, the amplitude spectrum of typical wave forms (HPM, damped sine, double exponential pulse) will be compared.

It will be demonstrated that transfer function measured on TO using the original HPM antenna set up (with a coaxial to waveguide adapter) can be useful to reduce the time and effort of an HPM Test.

Finally, it will be presented how these transfer functions fit with frequency dependant susceptibility levels.