Design and Analysis of Site Source for Radiated Emission Test

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ABSTRACT

Electromagnetic interferences (EMI) has becomes a major concern of our daily life due to the increasing application of digital electronic devices. The monitoring of EMI has therefore emerged as a major issue. Radiation emission test must be performed under specialized conditions for EMI measurements. Requirements for test site must be flat, free of overhead wires, away from reflecting structures, and the usage of good quality coaxial cables is recommended. Therefore, the accuracy of test site is very important. The standard EMI radiation sources maybe generated from three different sources, namely, the adjustable signal generator, statistical white noise generator, and the harmonic generator. In this thesis, we used the harmonic generator as the source. The oscillator sources used a crystal oscillator together with designed RC charge-discharge circuit integrate into Schmitt-Trigger Inverter SN74ACT14 to generate the fast transition speed of trapezoidal waveforms. The oscillator sources are combined amplifier model MMG3002NT1 manufactured by FREESCALE SEMICONDUCTOR Inc. to amplifying the amplitude of the harmonics. A spiral antenna was implemented as the radiating structure for the signal source and the measurement was performed in the frequency range 30 MHz to 1 GHz. For application of the standard site sources for the monitor of daily test site radiation emission, repeated tests were carried out to check the frequency and power stability of the standard site sources.

Keywords : Standard Site Source ; Radiation Emission ; Harmonic generator

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