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Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by SC 77B: High frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

The text of this interpretation sheet is based on the following documents:

ISH	Report on voting
77B/568/ISH	77B/573/RVD

Full information on the voting for the approval of this interpretation sheet can be found in the report on voting indicated in the above table.

IEC 61000-4-3 contains quick checks embedded in the field calibration process (subclause 6.2), in which the operator tests whether the amplifier is able to produce the desired RF power without saturation.

Step j) of the calibration process as per 6.2.1 describes this check for the constant field strength calibration method:

j) Confirm that the test system (e.g. the power amplifier) is not in saturation. Assuming that E_C has been chosen as 1,8 times E_t, perform the following procedure at each calibration frequency:

j-1) Decrease the output from the signal generator by 5,1 dB from the level needed to establish a forward power of P_C, as determined in the above steps (-5,1 dB is the same as E_C /1,8);

j-2) Record the new forward power delivered to the antenna;

j-3) Subtract the forward power measured in step j-2 from P_C. If the difference is between 3,1 and 5,1 dB, then the amplifier is not saturated and the test system sufficient for testing. If the difference is less than 3,1 dB, then the amplifier is saturated and is not suitable for testing.

The corresponding check within the constant power calibration method as per 6.2.2 is defined as step m):

m) Confirm that the test system (e. g. the power amplifier) is not in saturation. Assuming that E_C has been chosen as 1,8 times E_t, perform the following procedure at each calibration frequency:

m-1) Decrease the output from the signal generator by 5,1 dB from the level needed to establish a forward power of P_C, as determined in the above steps (-5,1 dB is the same as E_C /1,8);

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m-2) Record the new forward power delivered to the antenna;

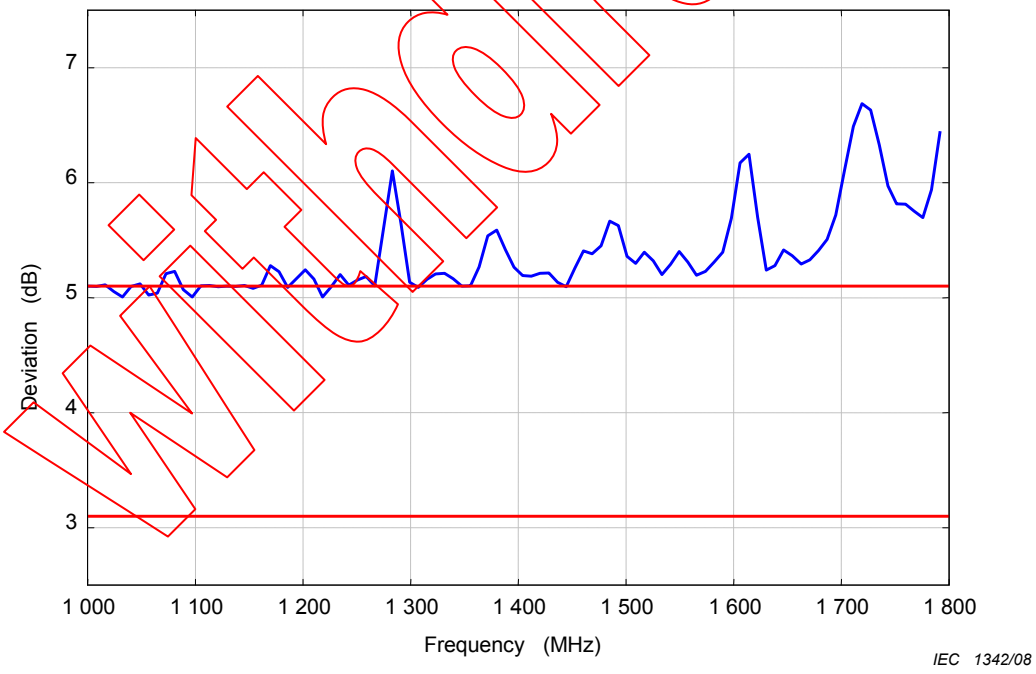
m-3) Subtract the forward power measured in step m-2 from P_C. If the difference is between 3,1 dB and 5,1 dB, then the amplifier is not saturated and the test system is sufficient for testing. If the difference is less than 3,1 dB, then the amplifier is saturated and is not suitable for testing.

Some amplifiers show deviations of more than 5,1 dB without causing any problems during testing. That behaviour is caused by their special functional principle (above all travelling wave tube amplifiers). Figures 1 and 2 show some measurement results obtained from a semiconductor amplifier as well as from a TWT amplifier.

The text described in j-3, respectively m-3, unfortunately gives no clear answers on the usability of these amplifiers.

After discussion at the 20th meeting of SC 77B/WG 10 on October, 22 - 26, 2007, the experts of WG 10 unanimously expressed their opinion that j-3 and m-3 are to be interpreted such that amplifiers showing a deviation of more than 5,1 dB are suitable for testing. E.g. the amplifiers having a characteristic as shown in Figures 1 and 2 can be used to perform tests according to IEC 61000-4-3.

Withdrawn



Target field strength is 30 V/m.

Figure 1 – Deviation as defined in step j-3 for a 200 W TWT-amplifier

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