© IEC 2021

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

IEC 61000-3-2

Edition 5.0 2018-01
Amendment 1 2020-07

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤16 A per phase)

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by subcommittee 77A: EMC – Low frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

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

DISH	Report on voting
77A/1106/DISH	77A/1114/RVDISH

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.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

_____

IEC 61000-3-2:2018-01/AMD1:2020-07/ISH1:2021-08(en-fr)

ICS 33.100.10

Interpretation of the second set of requirements applicable to Class C equipment with a rated power ≥ 5 W and ≤ 25 W according to 7.4.3 of IEC 61000-3-2:2018 and IEC 61000-3-2:2018/AMD1:2020.

Introduction

The second set of requirements of 7.4.3 of IEC 61000-3-2:2018 and IEC 61000-3-2:2018/AMD1:2020 requires that "*the waveform of the input current shall be such that it reaches the 5 % current threshold before or at 60°, has its peak value before or at 65° and does not fall below the 5 % current threshold before 90°, referenced to any zero crossing of the fundamental supply voltage*" and that "*Components of current with frequencies above 9 kHz shall not influence this evaluation (a filter similar to the one described in 5.3 of IEC 61000-4-7:2002 and IEC 61000-4-7:2002/AMD1:2008 may be used);*"

Testing laboratories and Class C equipment manufacturers concluded that several harmonics test systems with IEC 61000-4-7 compliant measurement equipment do not completely filter out the components of current with frequencies above 9 kHz, thus resulting in a non-accurate evaluation of the phase angles (see Figure 1). One of the reasons why filters are not used is that they can alter the phase angle itself by introducing a phase delay.

Question

When applying the second set of requirements in 7.4.3, what method shall be used to measure the phase angle in order to avoid the influence of components of current with frequencies above 9 kHz?

Interpretation

Given the issues reported by test laboratories, if the phase angle is measured with an IEC 61000-4-7 test system that doesn't remove the components above 9 kHz correctly, the measurements with a digital oscilloscope shall prevail, where the components above 9 kHz have been removed without affecting the phase angle at which the peak current occurs.

NOTE This can be achieved for example by using a synchronous averaging mode of the oscilloscope (see Figure 2).

Annex

Figure 1 and Figure 2 show an incorrect and the correct evaluation of the phase angle.

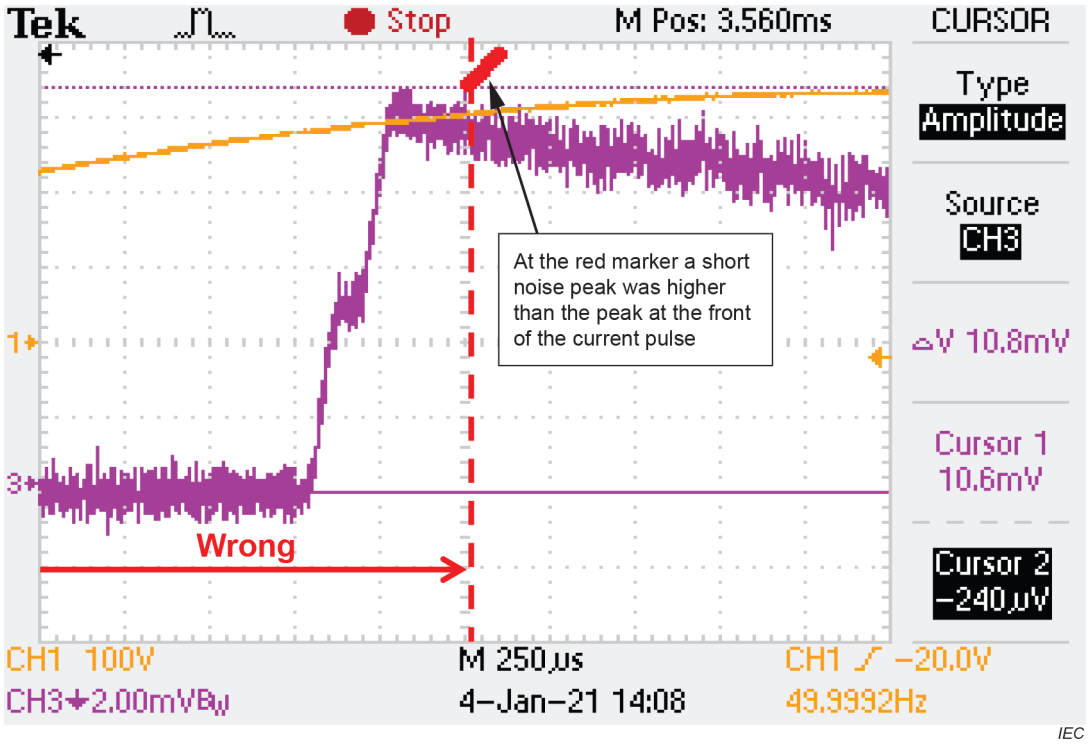


Figure 1 – Incorrect measurement

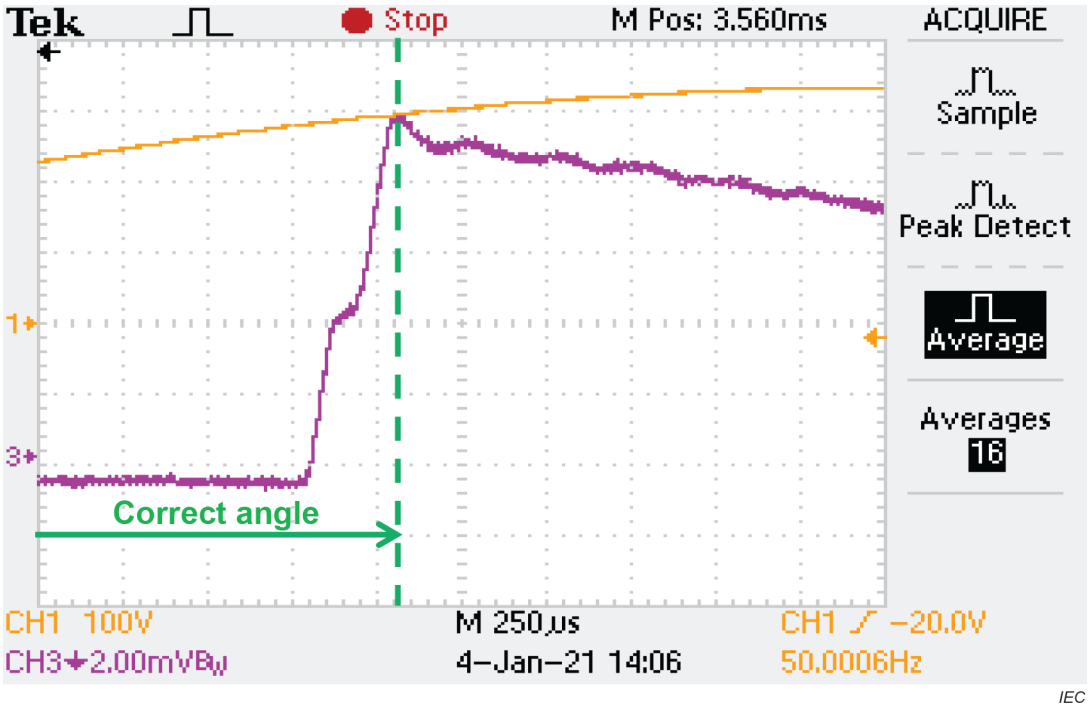


Figure 2 – Correct measurement with averaged waveform