MEASURING CONDUCTED EMISSION LIMITS IN LINE WITH IEC/EN 61000-3-2

Today's electronic devices often draw non-sinusoidal, irregular current where harmonic current is fed back into the universal supply system. Monitoring this current is both crucial and mandatory for CE compliant devices. The R&S®NPA701 compliance tester seamlessly and efficiently monitors this current.

Typical test setup with the R&S®NPA701 compliance tester and the R&S®NPA-Z1 socket adapter

Your task

Modern electronic devices use switched-mode power supplies that can generate strong harmonic current which is then injected back into the mains supply network. IEC/EN 61000-3-2 defines harmonic current emission limits for four equipment classes. Harmonic current must be analyzed for precisely defined periods and remain within specified limits based on the equipment class and cycle time.

The required accuracy up to the 40th harmonic makes automated testing essential.

Rohde&Schwarz solution

The R&S®NPA701 compliance tester seamlessly acquires and processes signals in real time for accelerated measurements. Precise measurements ensure standard compliance, even for critical designs.

The optional R&S®NPA-Zx mains adapter makes plugging the DUT into the R&S®NPA701 simple and safe. The cables that come with the adapter are connected to sockets on the front of the instrument. Country-specific adapters can be used for connection in different countries.

The setup wizard eliminates guesswork

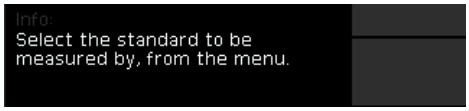
The R&S®NPA701 setup wizard guides users through measurements and configures the instrument parameters to minimize measurement errors and quickly reveal results. The measurement process is fully automatic. No prior knowledge of the standards is necessary.

All environmental variables (supply voltage and mains quality) are constantly monitored and displayed during measurements. Deviations are color-coded.

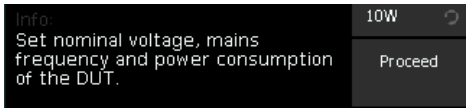
The measurement steps

1. Select the IEC/EN 61000-3-2 standard in the wizard.
2. Set the correct mains voltage and mains frequency (manually, or automatically by selected region) and set the expected power consumption for the DUT.
3. Select the right device class.
4. Set the crest factor and maximum current (RMS).
5. If known, set the current consumption pattern (static, cyclic or variable) to speed up the measurement.
6. Connect the DUT as instructed in the wizard and switch the DUT to the desired operating mode.
7. The results, including min. and max. values, are clearly displayed during and after the measurement.

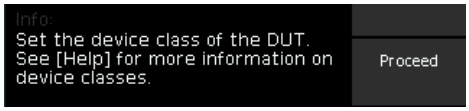
ROHDE&SCHWARZ
Make ideas real



Step 1



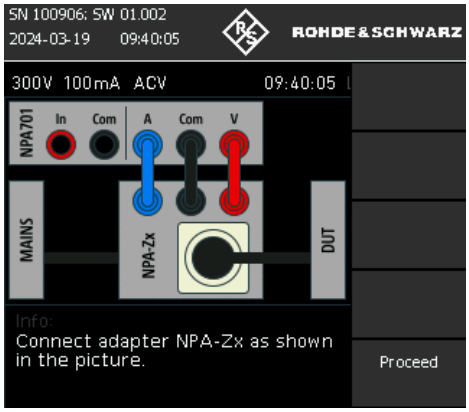
Step 2



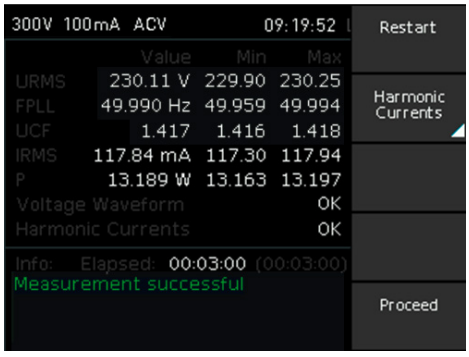
Step 3

Step 4

Step 5



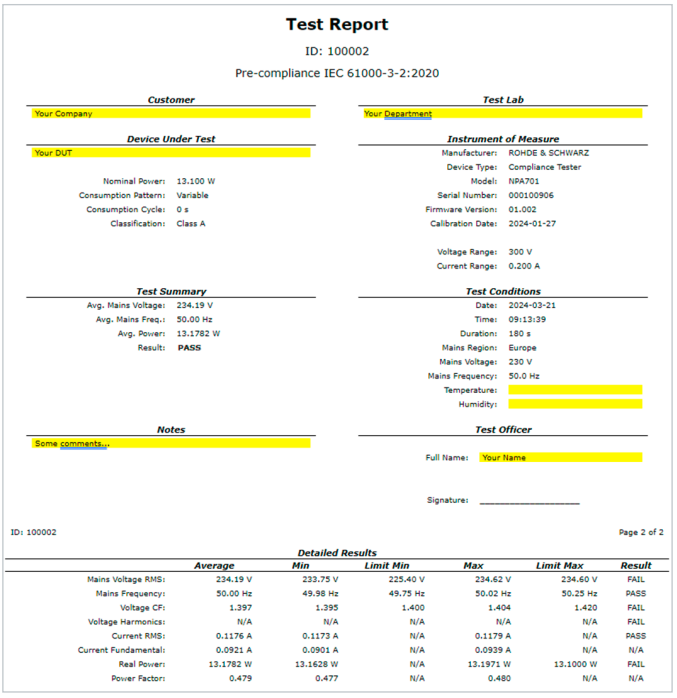
Step 6



Step 7

Test report

When the measurement is completed, the results can be saved to a USB flash drive. An interactive HTML form is created that can be filled in with user data to tailor the test report to your specific needs.



Test Report

ID: 100002

Pre-compliance IEC 61000-3-2:2020

Customer
Your Company

Test Lab
Your Department

Device Under Test
Your DUT

Nominal Power: 13.100 W
Consumption Pattern: Variable
Consumption Cycle: 0 s
Classification: Class A

Instrument of Measure
Manufacturer: ROHDE & SCHWARZ
Device Type: Compliance Tester
Model: NPA701
Serial Number: 000100906
Firmware Version: 01.002
Calibration Date: 2024-01-27

Voltage Range: 300 V
Current Range: 0.200 A

Test Summary
Avg. Mains Voltage: 234.19 V
Avg. Mains Freq.: 50.00 Hz
Avg. Power: 13.1782 W
Result: PASS

Test Conditions
Date: 2024-03-21
Time: 09:13:39
Duration: 180 s
Mains Region: Europe
Mains Voltage: 230 V
Mains Frequency: 50.0 Hz
Temperature:
Humidity:

Notes
Some comments...

Test Officer
Full Name: Your Name
Signature: _____

ID: 100002 Page 2 of 2

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	234.19 V	233.75 V	225.40 V	234.62 V	234.60 V	FAIL
Mains Frequency:	50.00 Hz	49.98 Hz	49.75 Hz	50.02 Hz	50.25 Hz	PASS
Voltage CF:	1.397	1.395	1.400	1.404	1.420	FAIL
Voltage Harmonics:	N/A	N/A	N/A	N/A	N/A	FAIL
Current RMS:	0.1176 A	0.1173 A	N/A	0.1179 A	N/A	PASS
Current Fundamental:	0.0921 A	0.0901 A	N/A	0.0939 A	N/A	N/A
Real Power:	13.1782 W	13.1628 W	N/A	13.1971 W	13.1000 W	FAIL
Power Factor:	0.479	0.477	N/A	0.480	N/A	N/A

Summary

The R&S®NPA701 compliance tester from Rohde&Schwarz enables accurate and easy testing of harmonic current emissions in electronic devices, automates the testing process in line with IEC/EN 61000-3-2 standards, ensures compliance and has a user-friendly setup wizard. The precise test results can be also saved on a USB flash drive.

See also

www.rohde-schwarz.com/product/NPA

Designation	Type	Order No.
Compliance tester, DC to 100 kHz	R&S®NPA701	3657.0562.04
Compliance tester, DC to 100 kHz, incl. IEEE-488 (GPIB) interface	R&S®NPA701-G	3638.4472.03
Mains adapter, EU version	R&S®NPA-Z1	3657.8911.02
Mains adapter, UK version	R&S®NPA-Z2	3657.8911.03
Mains adapter, US version	R&S®NPA-Z3	3657.8911.04
Mains adapter, CHN/AUS version	R&S®NPA-Z4	3657.8911.05

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PD 3672.9644.92 | Version 01.00 | March 2024 (ja)
Measuring conducted emission limits in line with IEC/EN 61000-3-2
Data without tolerance limits is not binding | Subject to change

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