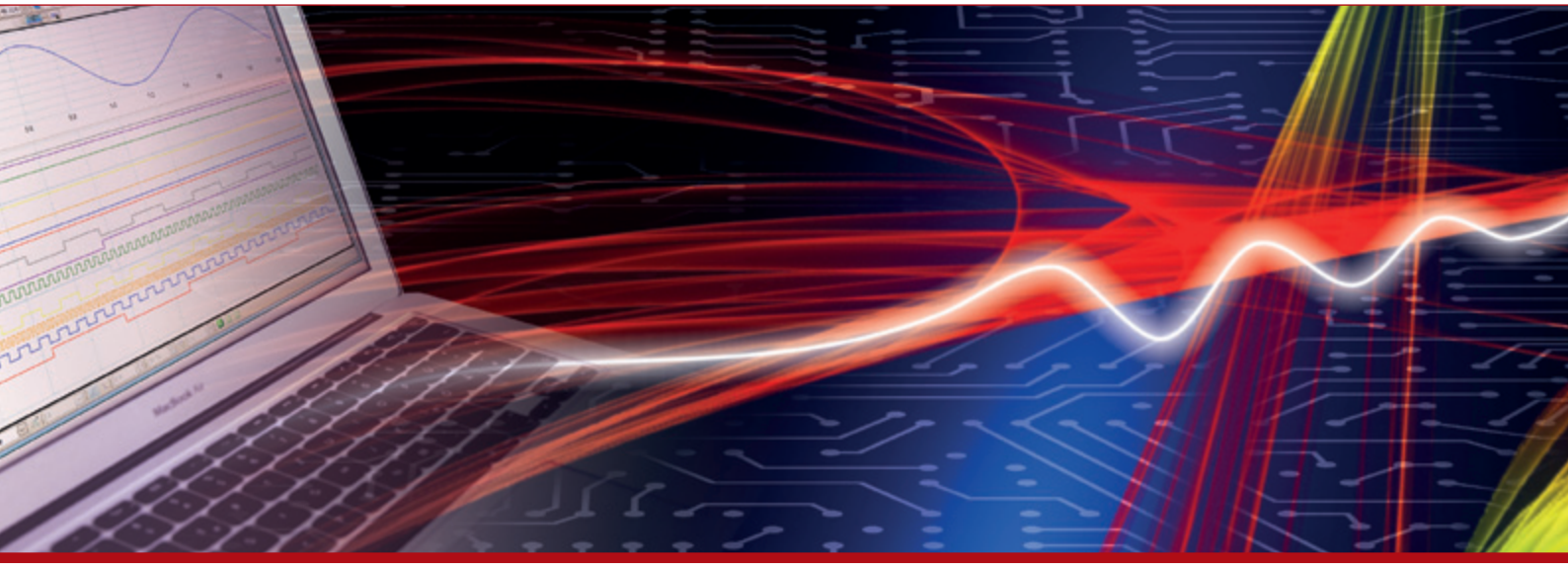
Product Datasheet - Technical Specifications



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TBCG3-CN Comb Generator

1 Introduction

The TBCG3-CN comb generator is primarily designed to verify conducted emission test set ups. It is a useful tool to validate correct operation of the LISN, correct set-up and correct configuration of the spectrum analyzer.
A rotary switch allows you to choose between five fixed comb frequencies and an external excitation input with a frequency range of 5 kHz to 300 MHz.
The comb generator comes with country specific adapter cables, which plug into the DUT socket of the (unpowered!) LISN.
The device is powered by four AA NiMH batteries and includes an external charger.

Picture 1: TBCG3-CN comb generator

The TBCG3-CN produces a comb spectrum with approximately 8 dB flatness in the frequency range up to 1.5 GHz and has a 50 Ohm output with a female N-connector.
The housing is milled from solid aluminium. A ¼” – 20 UNC thread in the comb panel accepts standard tripod bolts.

TBCG3-CN Comb Generator

2 Specification

Specified bandwidth: 1.5 GHz
Flatness of the comb spectrum: 8 dB typically
Output impedance: 50 Ohm
Output power: 66 dBµV @ 10 MHz f_{comb}; decreasing 6 dB with every $f_{comb}/2$
Amplitude stability: < 0.2 dB; <0.1 dB after 15 minutes
Aging: < 0.5 dB over 12 months
Output connector: N-female
Selectable, fixed comb frequencies: 100 kHz, 500 kHz, 1 MHz, 5 MHz, 10 MHz
Frequency stability: 50 ppm
External excitation input: 5 kHz – 300 MHz @ square input signal; 3.3 Vpp max
100 kHz – 300 MHz @ sinus input signal; 3.3 Vpp max
Input impedance: 50 Ohm
Input connector: SMA-female
Current consumption: 70 mA
Indicators: Power On LED, Low Battery LED
Power supply: 4 x AA NiMH (e.g. Varta Mignon 2700, not supplied)
Charger: external; Ansmann ACS110
Operation time: battery capacity / 70 mA
Temperature range: -20°C to +45 °C
Housing diameter: 180 mm
Housing height: 60 mm
Weight: 1250 g

3 Spectrum plots, f_{comb}: 10 MHz, 5 MHz, 1 MHz, 500 kHz, 100 kHz

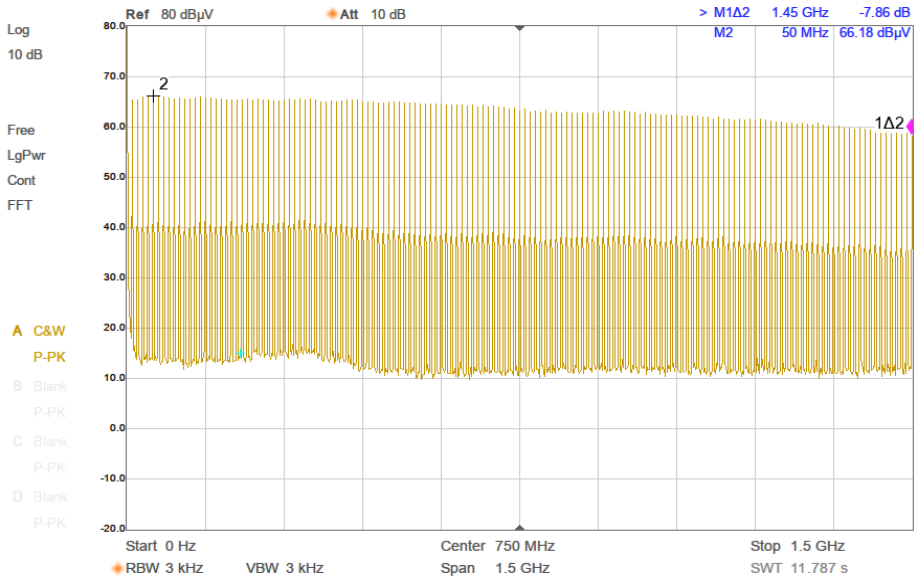

Figure 1 - f_{comb}: 10 MHz; 66 dBµV @ 50 MHz; spectrum flatness up to 1.5 GHz: -8dB

TBCG3-CN Comb Generator

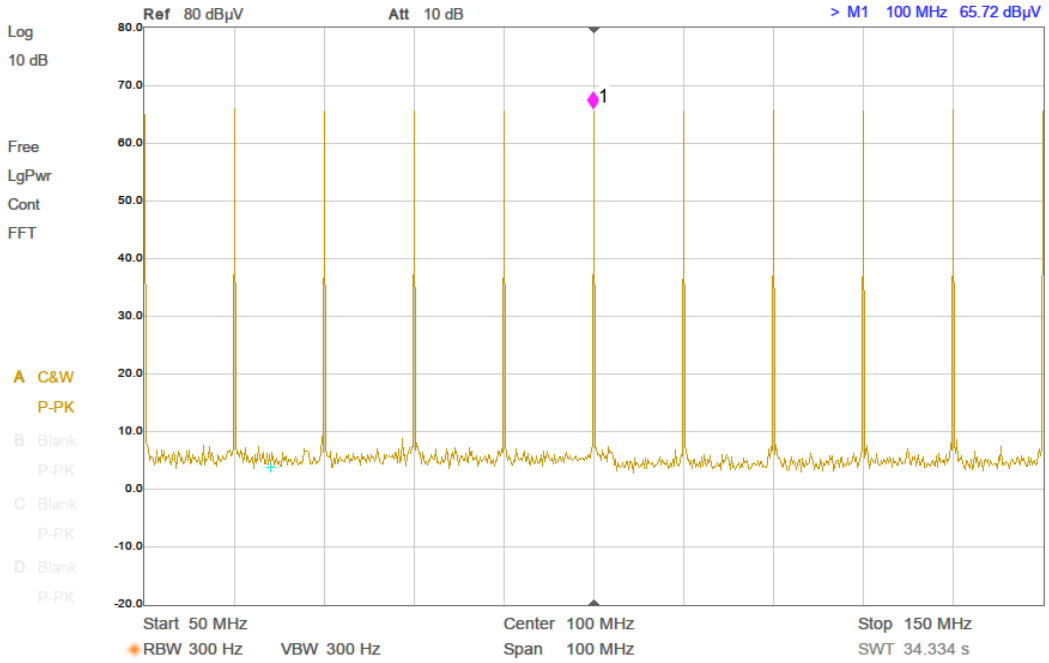

Figure 2 – zoomed; f_{comb}: 10 MHz; span: 50 MHz – 150 MHz

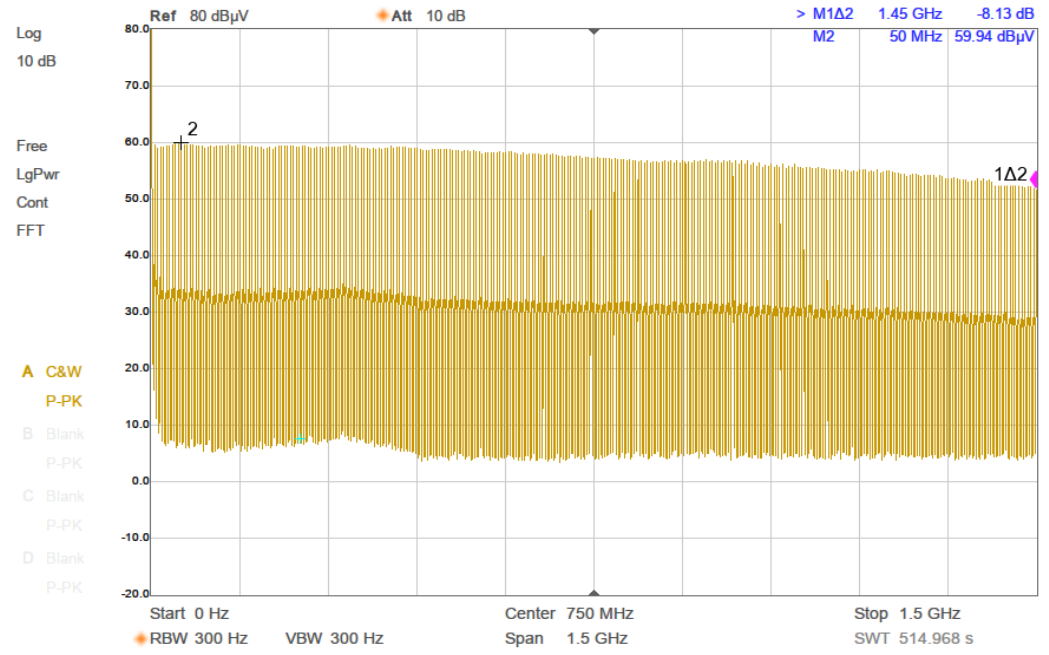

Figure 3 - f_{comb}: 5 MHz; 60 dBµV @ 50 MHz; spectrum flatness up to 1.5 GHz: -8dB

TBCG3-CN Comb Generator

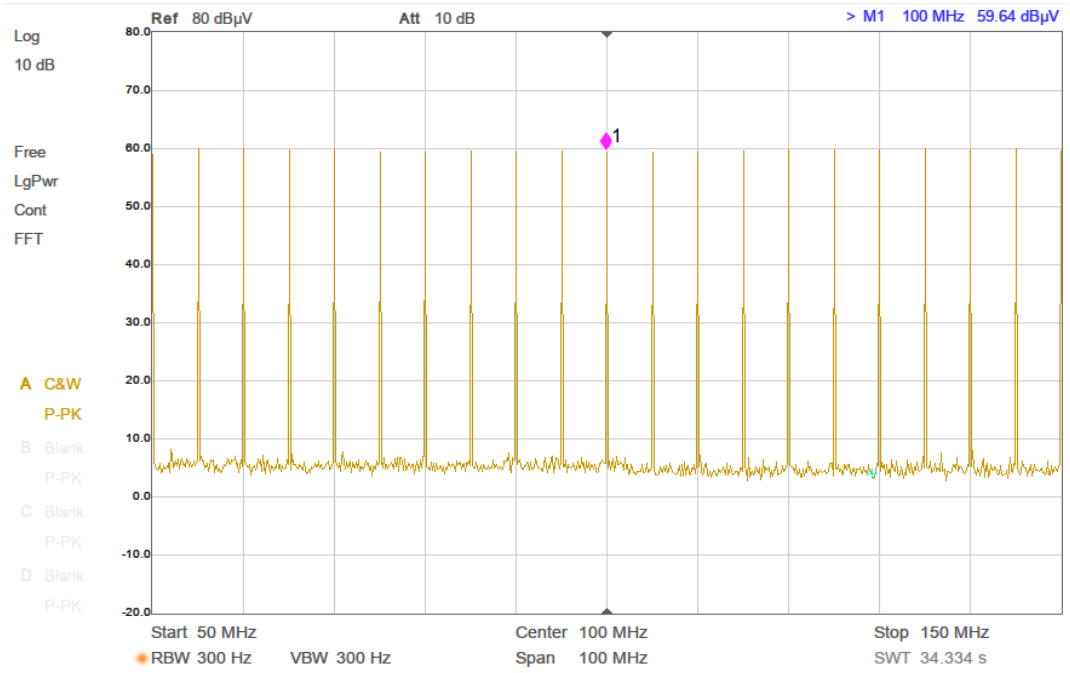

Figure 4 – zoomed; f_{comb}: 5 MHz; span: 50 MHz – 150 MHz

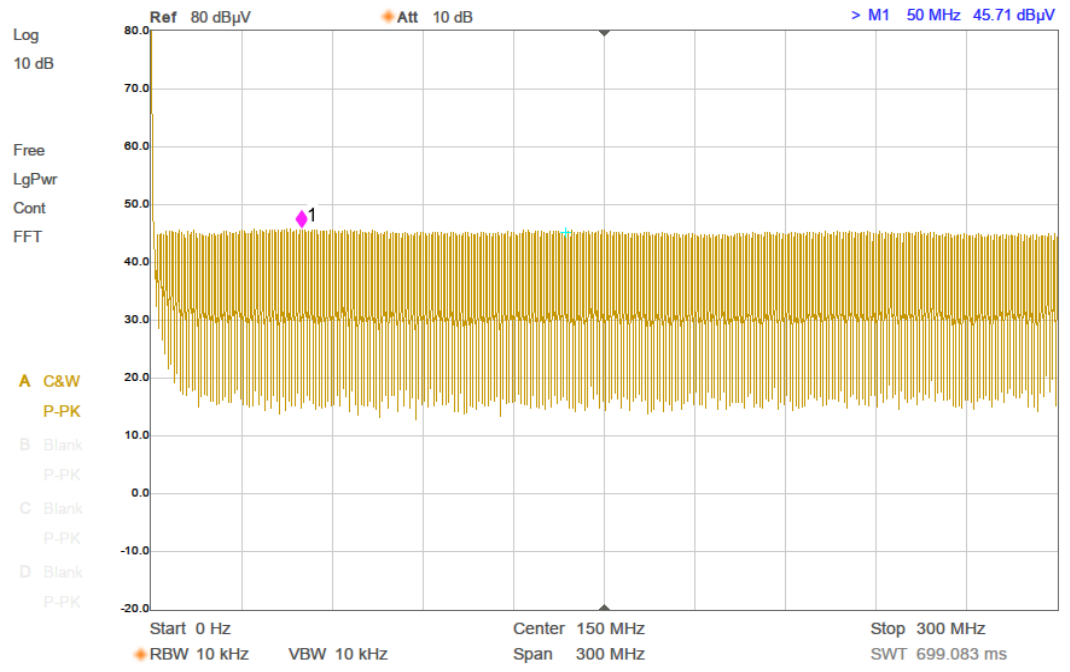

Figure 5 – zoomed; f_{comb}: 1 MHz; 45 dBµV @ 50 MHz;
span: 0 MHz – 300 MHz; spectrum flatness up to 1.5 GHz: -8dB

TBCG3-CN Comb Generator

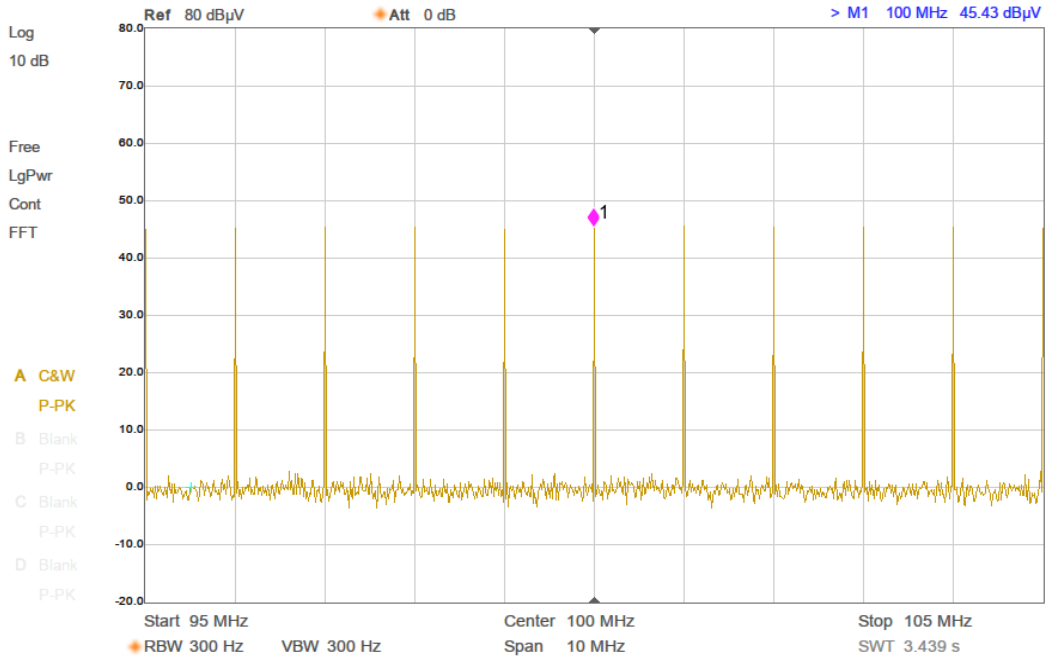

Figure 6 – zoomed; f_{comb}: 1 MHz; span: 95 MHz – 105 MHz

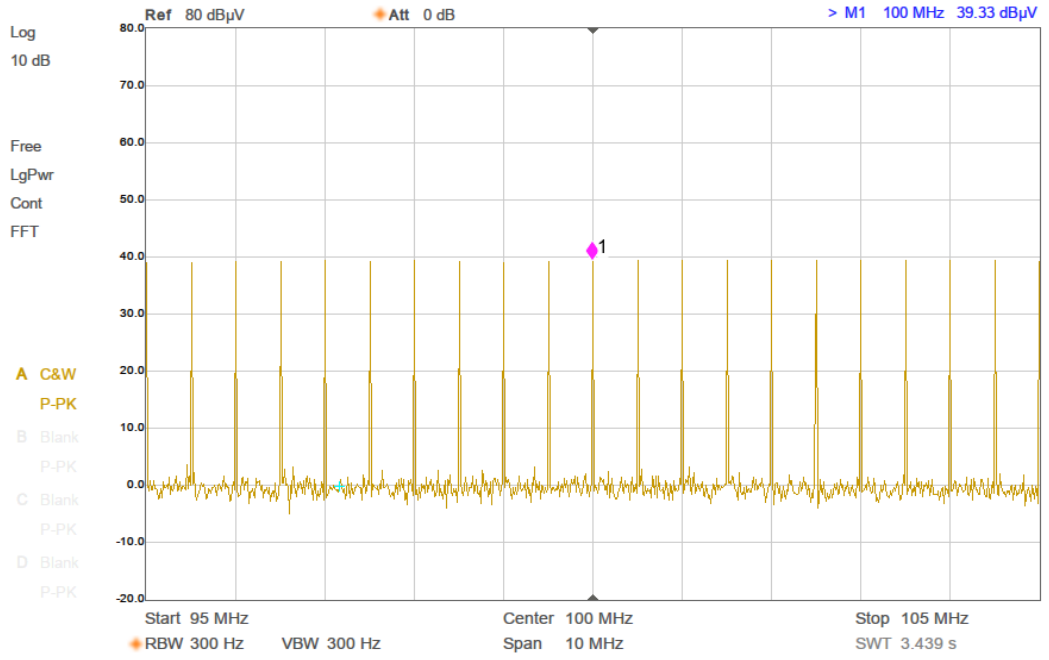

Figure 7 – zoomed; f_{comb}: 500 kHz; 39 dBµV @ 100 MHz; span: 95 MHz – 105 MHz; spectrum flatness up to 1.5 GHz: -8dB

TBCG3-CN Comb Generator

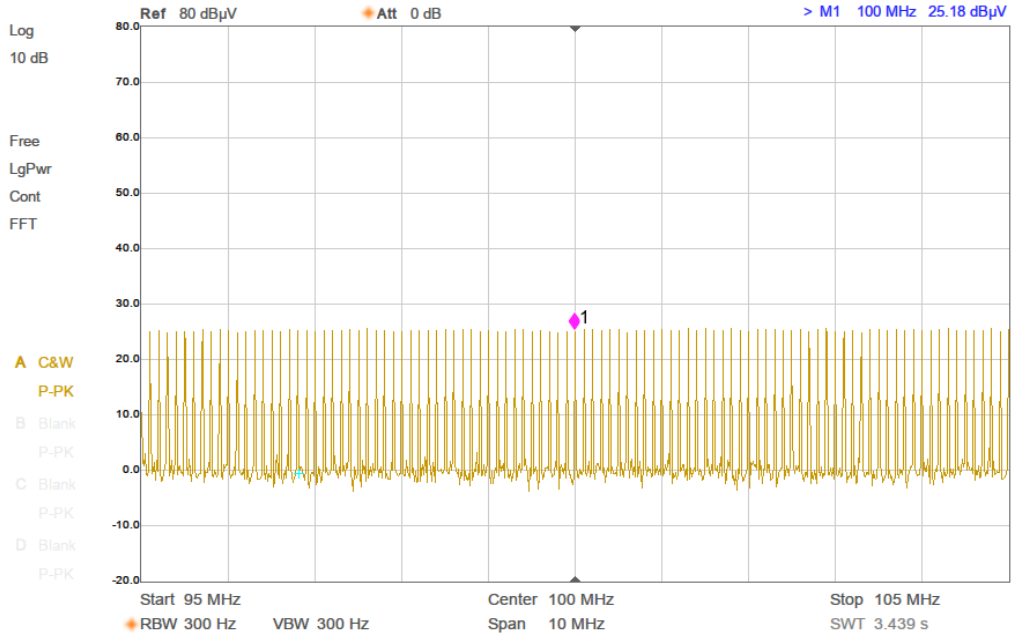

Figure 8 – zoomed; f_{comb}: 100 kHz; 25 dBµV @ 100 MHz;
span: 95 MHz – 105 MHz; spectrum flatness up to 1.5 GHz: -17dB

4 Spectrum plots, external frequency input

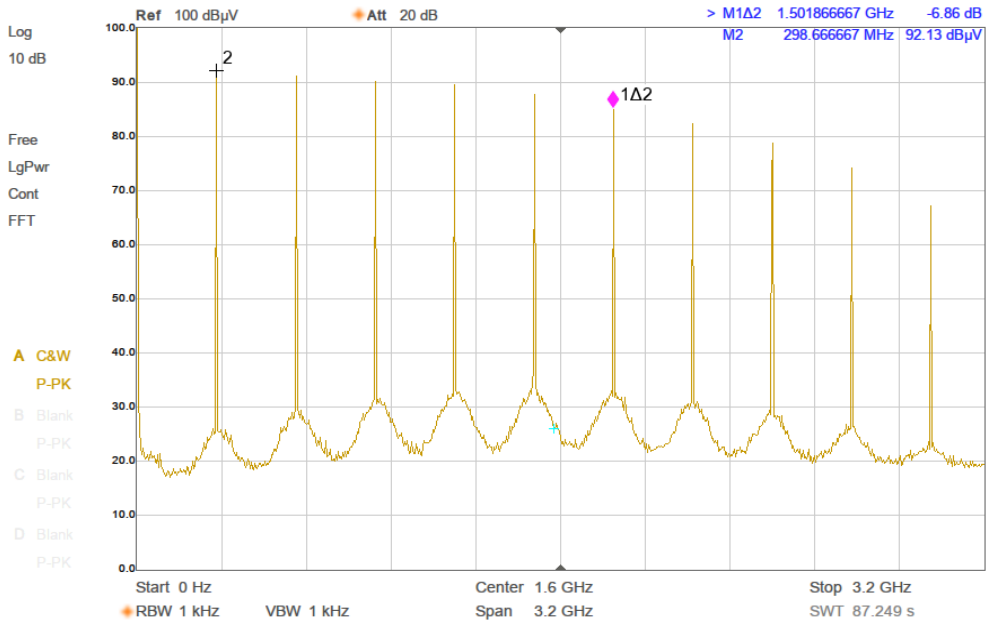

Figure 9 - f_{comb}: 300 MHz; 92 dBµV @ 300 MHz; spectrum flatness up to 1.5 GHz: -7dB
Signal amplitude at external input: +6 dBm

TBCG3-CN Comb Generator

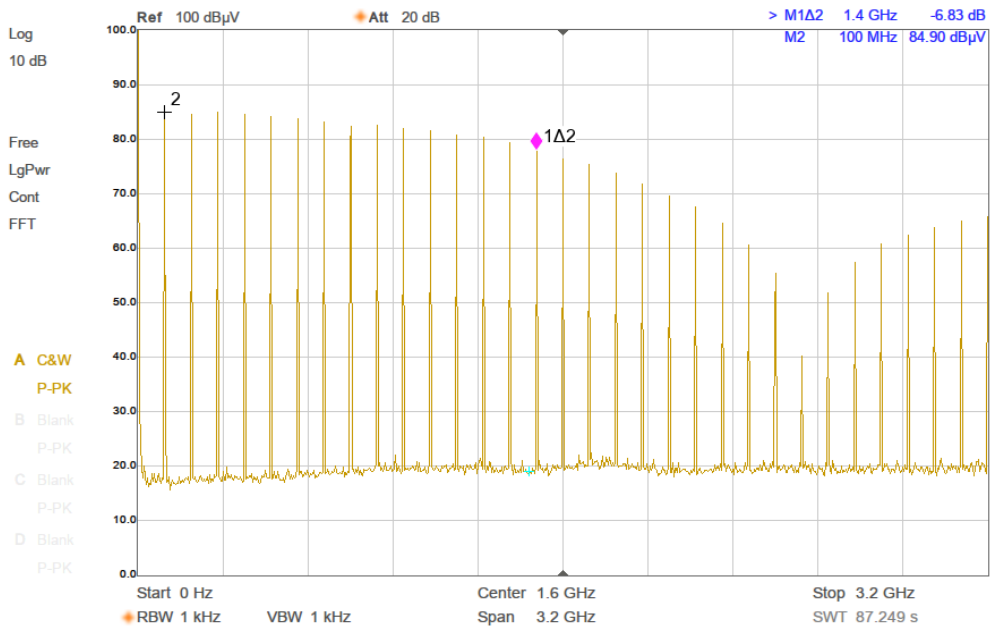

Figure 10 - f_{comb}: 100 MHz; 85 dBµV @ 100 MHz; spectrum flatness up to 1.5 GHz: -7dB
Signal amplitude at external input: +6 dBm

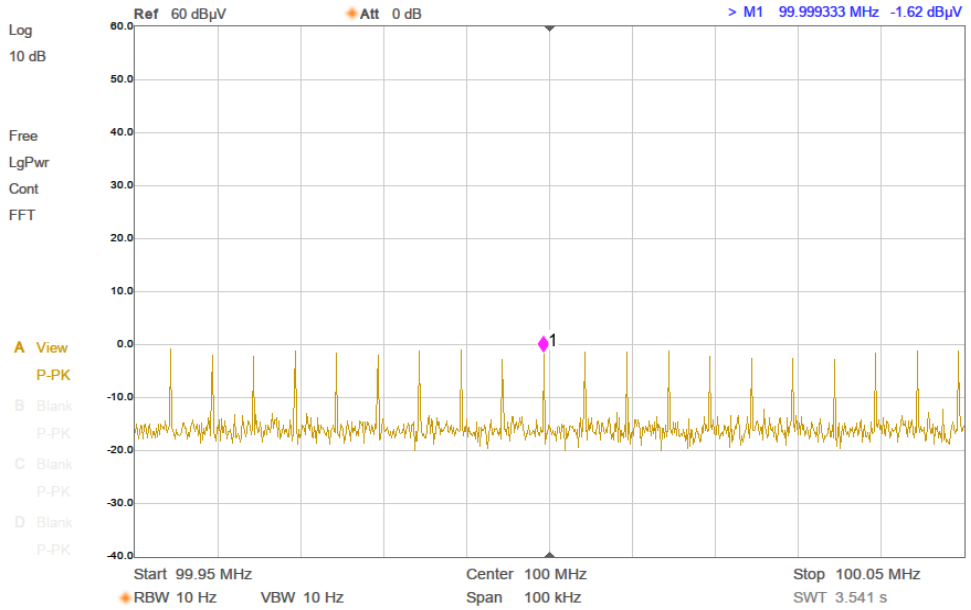

Figure 10 – zoomed; f_{comb}: 5 kHz; -1 dBµV @ 100 MHz;
span: 99.95 MHz – 100.05 MHz
Signal amplitude at external input: square, 3.3 Vpp

TBCG3-CN Comb Generator

5 Application

Checking the sanity of a LISN or conducted emission measurement setup.

There is no need to swap the N-connectors of the LISN adapter cable to switch between LISN channels, when utilising a TBRFPS1 power splitter:

Picture 1: TBCG3-CN connected to a LISN utilizing a RF power splitter

Warning:

Never connect the comb generator or the comb generator adapter cable to a powered LISN to avoid potentially lethal electric shock. Before connecting the comb generator adapter cable into the DUT / EUT socket, always unhook the mains connector on the back of the LISN.

Never plug the comb generator adapter cord into a power outlet to avoid potentially lethal electric shock.

6 Inserting / replacing batteries

Loosen the SMA-connector nut a few turns. Remove the six screws at the bottom of the comb generator housing, lift it, and insert four AA rechargable 1.2V NiMH batteries. Both the battery compartment and the PCB indicate the polarity.
Reattach the bottom cover, then tighten the screws and the SMA-connector nut.

TBCG3-CN Comb Generator

7 Ordering Information

Part Number	Description
TBCG3-CN-EU	Comb generator, Ansmann ACS110 charger, LISN adapter cable with Schuko connector
TBCG3-CN-UK	Comb generator, Ansmann ACS110 charger, LISN adapter cable with UK connector
TBCG3-CN-US	Comb generator, Ansmann ACS110 charger, LISN adapter cable with US connector
TBCG3-CN-AU	Comb generator, Ansmann ACS110 charger, LISN adapter cable with Australian connector
TBLA-3P-16A	BNC adapter for 3 Phase LISN TBL5032-16A EUT socket
TBLA-3P-32A	BNC adapter for 3 Phase LISN TBL5032-32A EUT socket
TBLA-PH1	BNC adapter for TBL5016-1 or TBL0550 EUT/SOURCE socket
TBLA-PH2	BNC adapter for TBL50100 or TBL05100 EUT/SOURCE socket
TBRFPS1	Power splitter

8 History

Version	Date	Author	Changes
V 1.0	4.2.2023	Mayerhofer	Creation