

RF CURRENT MONITORING PROBE

1 Introduction

The TBCP1-250 is a fixed aperture RF current monitoring probe, expanding the Tekbox product range of affordable EMC pre-compliance test equipment. The probe has a very flat response with a 3dB bandwidth of 250 MHz and is characterized and usable over the frequency range from 1 kHz to 300 MHz.



Picture 1: TBCP1-250 RF current monitoring probe

The aperture of the RF current monitoring probe is 25 mm. Its transfer impedance is $> 16 \text{ dB Ohm}$ in the range from 300 kHz to 250 MHz.

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2 Specification

Characterized frequency range: 1 kHz to 300 MHz
Aperture diameter: 25 mm
Outside diameter: 76 mm
Height: 31 mm
Weight: 320 g
Connector type: N female
Transfer impedance: 18 dB Ω in the flat region, typ.
3 dB bandwidth: 300 kHz - 250 MHz, typ.
Max. primary current (RF): 3 A
Max. core temperature: 125 °C



3 Transfer impedance

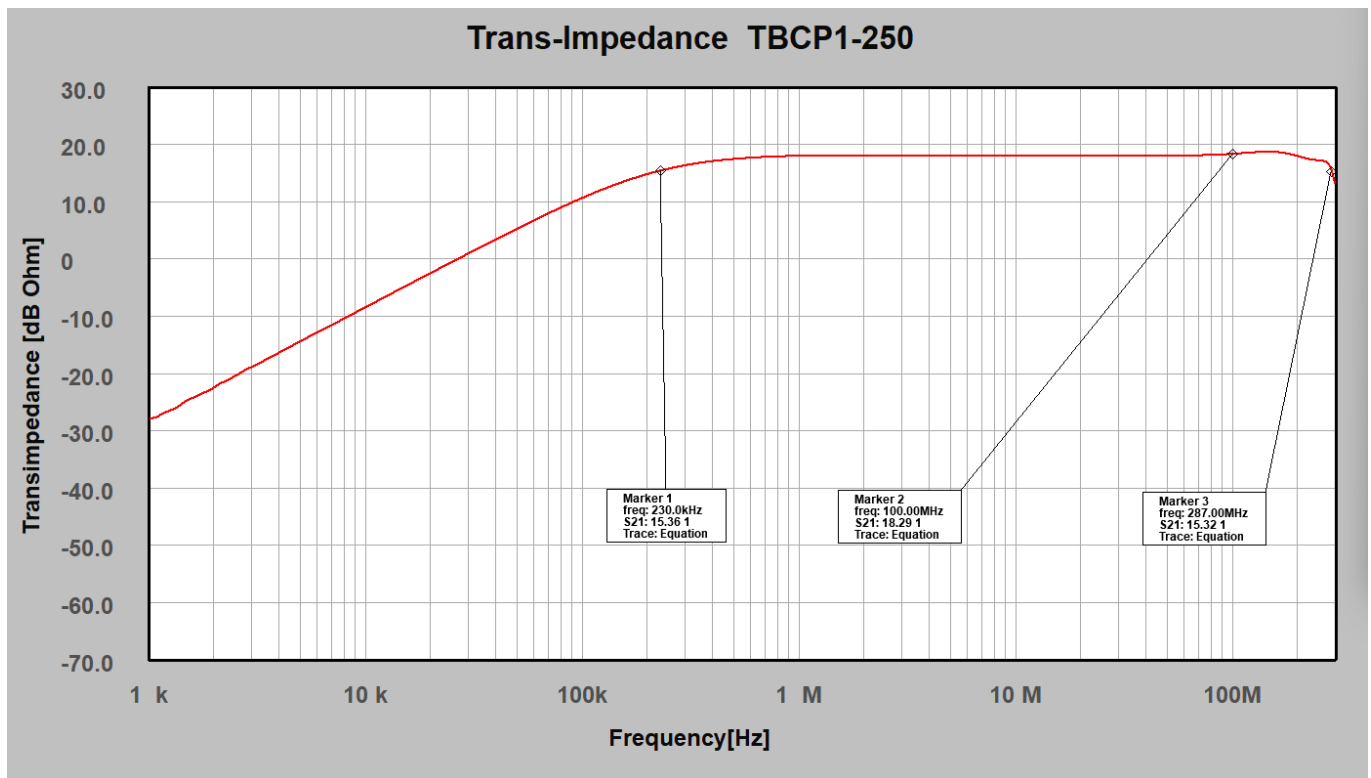


Figure1: typical transfer impedance: 1 kHz to 300 MHz

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4 Typical transfer impedance table

The table below shows typical transfer impedance data of a TBCP-250 current probe. Each current probe is delivered with its corresponding measurement protocol. This data can be used for the creation of a correction file for EMCview or similar EMC measurement software. The transfer impedance in dBΩ subtracted from the analyzer reading in dBμV gives the corrected reading in dBμA.

Refer to the application notes of EMCview on how to create a current probe correction file.

Frequency [MHz]	Transfer impedance [dBΩ]	Frequency [MHz]	Transfer impedance [dBΩ]
0.001	-27,90	50	17,98
0.0025	-20,56	75	18,09
0.005	-14,49	100	18,29
0.0075	-11,03	125	18,55
0.01	-8,51	150	18,65
0.025	-0,63	175	18,41
0.05	5,17	200	17,90
0.075	8,43	210	17,69
0.1	10,57	220	17,47
0.25	15,68	230	17,32
0.5	17,38	240	17,22
0.75	17,79	250	17,14
1	17,95	260	17,06
2.5	17,96	270	16,92
5	17,92	280	16,34
7.5	17,95	290	
10	17,97	300	
25	18,00		

Table1: Transfer impedance: 1 kHz to 300 MHz

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5 Accessory

Tekbox supplies a calibrator corresponding with the TBCP1 current probe series:



Picture 2: TBCP1-CAL RF current probe calibrator

6 Warning

RF current monitoring probes are primarily used for common mode disturbance measurements, where forward and return current pass the aperture in opposite directions and the magnetic field cancels out. When doing differential mode measurements or just passing a single current carrying wire through the aperture, EUTs with high inrush currents may cause a voltage transient, that might damage the receiver or analyzer frontend. Protect your equipment using attenuators, limiters, or disconnect the RF-input, while powering ON/OFF the EUT.

7 Ordering Information

Part Number	Description
TBCP1-250	Fixed aperture RF current monitoring probe, wooden box, calibration protocol 1 kHz – 300 MHz
TBCP1-CAL	Current probe calibrator for the TBCP1 series

8 History

Version	Date	Author	Changes
V 1.0	6.05.2018	Mayerhofer	Creation of the document
V 1.1	28.1.2021	Mayerhofer	Chapter 5 added
V 1.2	26.3.2024	Mayerhofer	Extended data to 1 kHz – 300 MHz
V 1.3	12.7.2025	Mayerhofer	Chapter 6 added

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