

RF CURRENT MONITORING PROBE

1 Introduction

The TBCP4-500 is a fixed aperture RF current monitoring probe, expanding the Tekbox product range of affordable EMC pre-compliance test equipment. The probe has a flat response with a 3dB bandwidth of 500 MHz and is characterized and usable over the frequency range from 1kHz to 600 MHz.



Picture 1: TBCP4-500 RF current monitoring probe

The aperture of the RF current monitoring probe is 32 mm. Its transfer impedance is 16 dB Ohm in the flat region, with a 3 dB bandwidth from 400 kHz to 500 MHz.

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2 Specification

Characterized frequency range: 1 kHz to 600 MHz

Aperture diameter: 32 mm

Outside diameter: 73 mm

Height: 20 mm

Weight: 320 g

Connector type: N female

Transfer impedance: 16 dB Ω in the flat region, typ.

3 dB bandwidth: 400 kHz – 500 MHz, typ.

Max. primary current (RF): 3 A

Max. core temperature: 125 °C



3 Transfer impedance

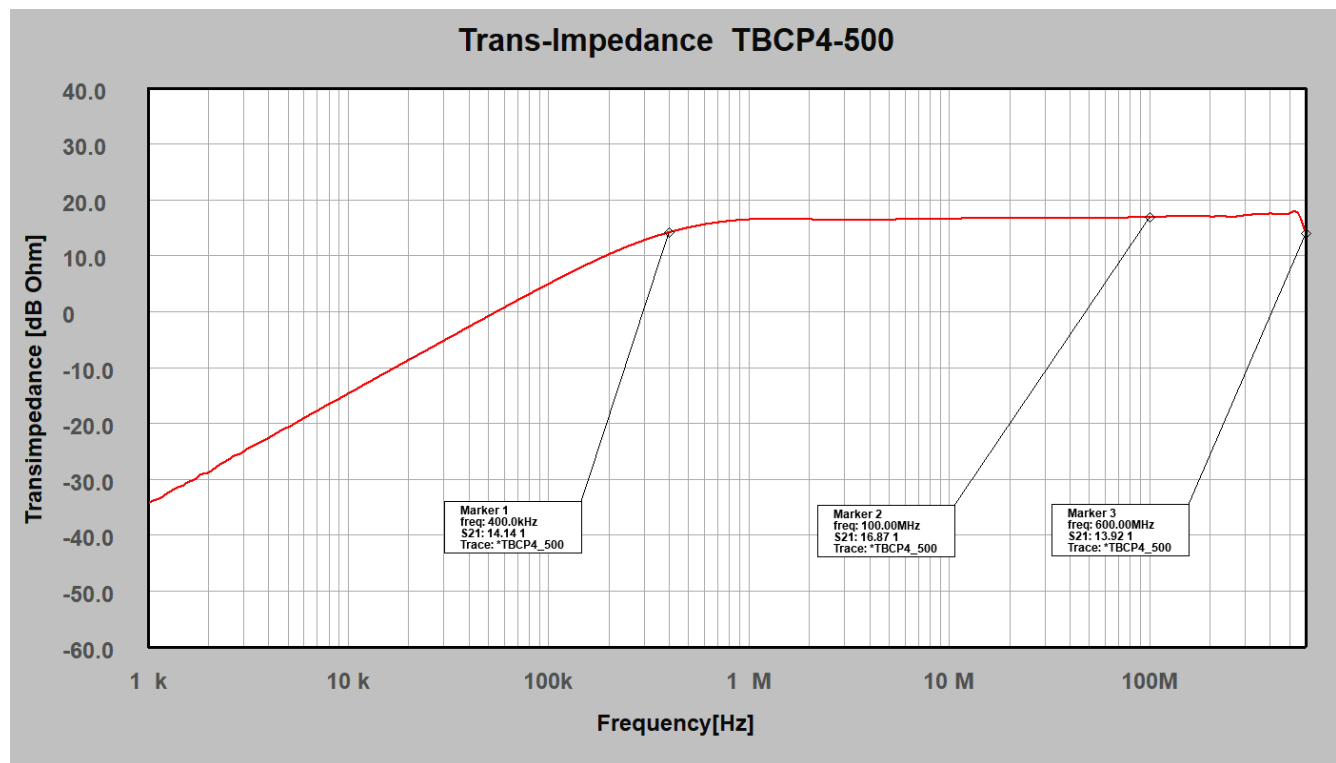


Figure1: typical transfer impedance: 1 kHz to 600 MHz

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4 Typical transfer impedance table

The table below shows typical transfer impedance data of a TBCP4-500 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	-34,33	100	16,87
0.0025	-26,64	125	16,98
0.005	-20,75	150	17,09
0.0075	-17,16	175	17,10
0.01	-14,70	200	16,96
0.0125	-12,80	225	16,98
0.015	-11,20	250	16,95
0.0175	-9,87	275	16,98
0.02	-8,72	300	17,22
0.025	-6,82	325	17,31
0.05	-0,88	350	17,46
0.075	2,53	375	17,41
0.1	4,90	400	17,50
0.125	6,70	425	17,33
0.15	9,23	450	17,41
0.175	10,19	475	17,41
0.2	12,73	500	17,52
0.25	14,14	510	17,70
0.5	15,01	520	17,86
0.75	16,06	530	17,90
1	16,45	540	17,77
2.5	16,42	550	17,47
5	16,44	560	17,01
7.5	16,51	570	16,39
10	16,59	580	15,64
25	16,73	590	14,80
50	16,74	600	13,92
75	16,77		

Table1: Transfer impedance: 1 kHz to 600 MHz, typical data

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5 Accessory

Tekbox supplies a calibration fixture corresponding with the TBCP4 RF current probe series:



Picture 2: TBCP4-CAL RF current probe calibration fixture

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
TBCP4-500	Snap on RF current monitoring probe, beech-wood box, calibration protocol
TBCP4-CAL	Calibration fixture for TBCP4 RF current probe series

8 History

Version	Date	Author	Changes
V 1.0	11.12.2020	Mayerhofer	Creation of the preliminary document
V 1.1	15.01.2021	Mayerhofer	Photo update
V 1.2	28.01.2021	Mayerhofer	Chapter 5 updated
V 1.3	4.08.2021	Mayerhofer	Correction in table 1
V 1.4	26.03.2024	Mayerhofer	Extended data to 1 kHz – 600 MHz
V 1.5	12.07.2025	Mayerhofer	Chapter 6 added

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