

RF CURRENT MONITORING PROBE

1 Introduction

The TBCP4-750 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 850 MHz and is characterized and usable in the frequency range from 1kHz to 1 GHz.



Picture 1: TBCP4-750 RF current monitoring probe

The aperture of the RF current monitoring probe is 32 mm. Its transfer impedance is 20 dB Ohm with a 3 dB bandwidth from 1.5 MHz to 850 MHz.

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2 Specification

Characterized frequency range: 1 kHz to 1 GHz
Aperture diameter: 32 mm
Outside diameter: 73 mm
Height: 20 mm
Weight: 320 g
Connector type: N female
Transfer impedance: 20 dB Ω in the flat region, typ.
3 dB bandwidth: 1.5 MHz – 850 MHz, typ.
Max. primary current (RF): 3 A
Max. core temperature: 125 °C



3 Transfer impedance

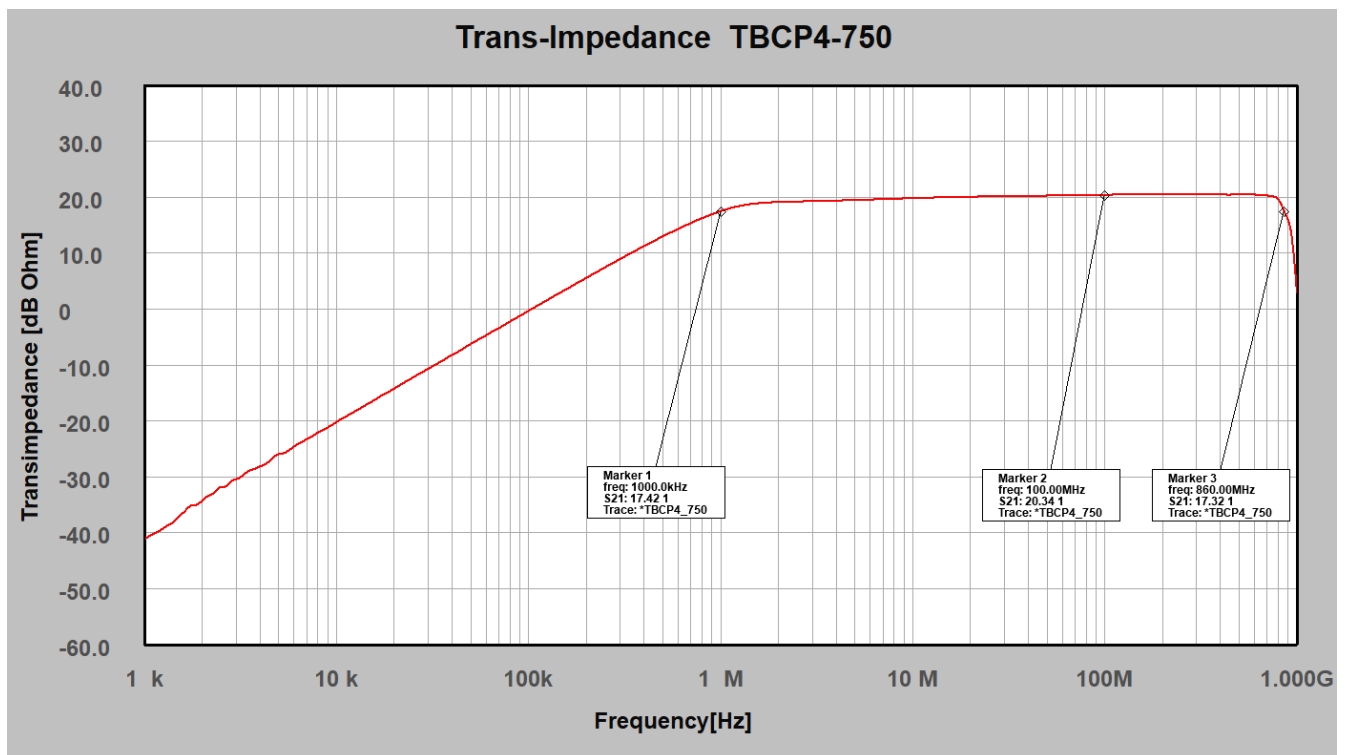


Figure1: typical transfer impedance: 1 kHz to 1 GHz

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4 Typical transfer impedance table

The table below shows typical transfer impedance data of a TBCP4-750 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	-41,24	325	20,53
0.0025	-31,92	350	20,53
0.005	-26,03	375	20,50
0.0075	-22,79	400	20,50
0.01	-20,26	425	20,40
0.025	-12,33	450	20,37
0.05	-6,33	475	20,45
0.075	-2,90	500	20,46
0.1	-0,40	525	20,42
0.25	7,38	550	20,45
0.5	12,91	575	20,49
0.75	15,76	600	20,40
1	17,42	625	20,31
2.5	19,16	650	20,28
5	19,41	675	20,26
7.5	19,60	700	20,21
10	19,74	725	20,15
25	20,07	750	20,06
50	20,21	775	19,90
75	20,28	800	19,54
100	20,34	825	18,80
125	20,41	850	17,74
150	20,48	875	16,74
175	20,49	900	15,84
200	20,44	925	14,35
225	20,44	950	11,55
250	20,45	975	7,52
275	20,44	1000	2,87
300	20,48		

Table1: Transfer impedance: 1 kHz to 1 GHz, 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 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
TBCP4-750	TBCP4 RF current monitoring probe, wooden box, calibration protocol 1 kHz – 1 GHz
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	26.03.2024	Mayerhofer	Extended data to 1 kHz – 1 GHz
V 1.4	12.07.2025	Mayerhofer	Chapter 6 added

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