

RF SURFACE CURRENT MONITORING PROBE

1 Introduction

The TBSCP1-5M300 is a RF surface current monitoring probe, expanding the Tekbox product range of affordable EMC pre-compliance test equipment.

The probe has a very flat response from 5 MHz to 300 MHz and is characterized over the frequency range from 30 kHz to 400 MHz. The TBSCP1-5M300 is for RF current monitoring applications that need to measure RF currents flowing on surfaces such as PCB groundplanes or traces, metal planes or wires.



Picture 1: TBSP1-5M300 RF current monitoring probe

The footprint of the RF current monitoring probe measures 40 mm x 15 mm. The transfer impedance is -7 dB Ohm with a typical 3dB bandwidth from 5 MHz to 300 MHz.

2 Specification

Characterized frequency range: 30 kHz to 400 MHz

Transfer impedance: -7 dB Ohm with a 3 dB bandwidth from 5 MHz to 300 MHz

Suppression of orthogonal field: typ. > 15 dB avg. up to 100 MHz

Footprint: 40 mm x 15 mm

Height: 30 mm

Weight: 25 g

Connector type: SMA female

Max. primary current (DC - 400 Hz): 150 A

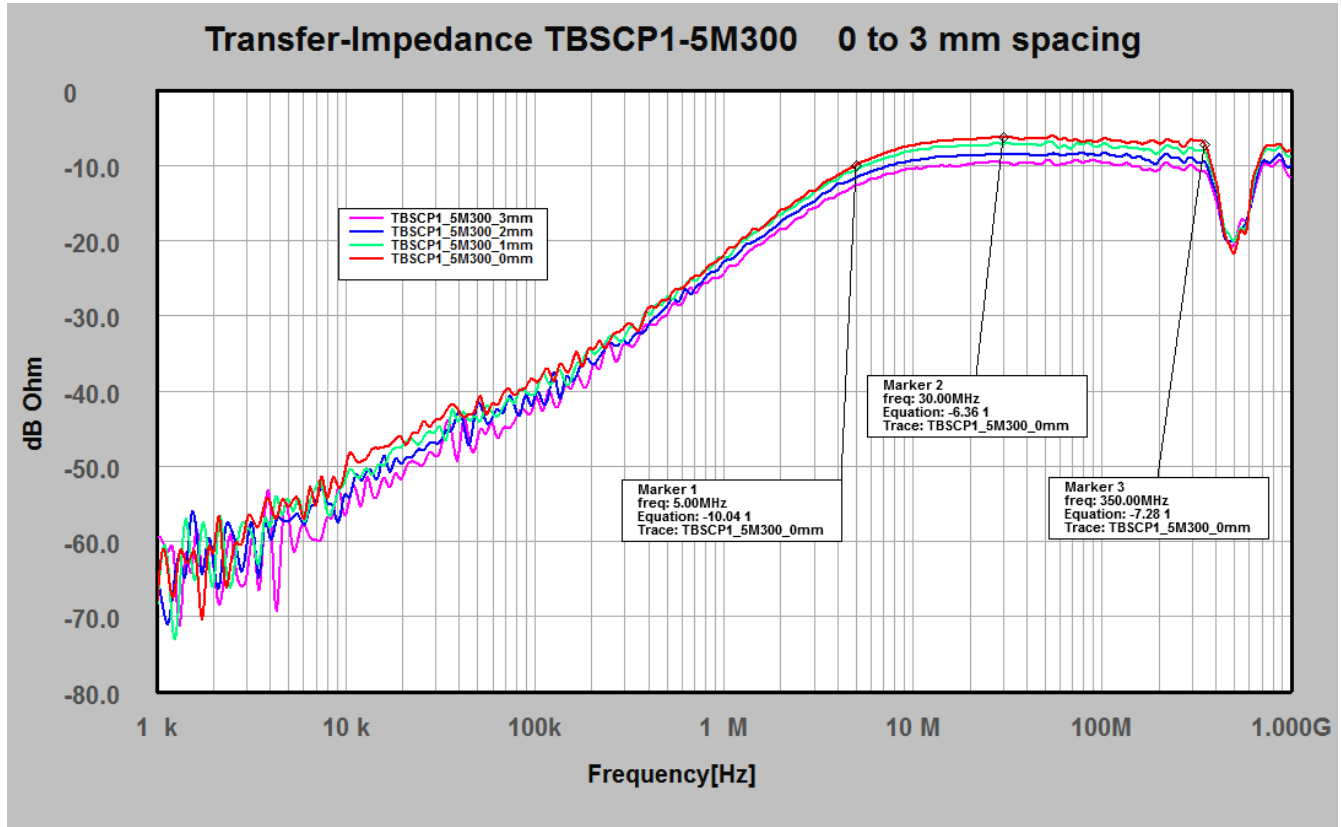
Max. primary current (RF): 12 A

Max. core temperature: 125 °C



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3 Transfer impedance



Picture 2: typical transfer impedance, curves for direct surface contact and 1 mm, 3 mm, 10mm spacing between probe and measured surface

4 Calibration

Place the probe on top of a 50 Ohm microstripline, terminated with 50 Ohm. Connect the microstripline to port 1 of a VNA and connect port 2 to the SMA connector of the probe. Measure S21 and add 34 dB to get the trans-impedance in dB Ohm.

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5 Typical transfer impedance table

The table below shows typical transfer impedance data of a TBSCP1-5M300 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]
0.03	-45.53	100	-6.59
0.05	-41.22	125	-6.81
0.075	-40.20	150	-6.91
0.1	-38.75	175	-6.96
0.25	-33.28	200	-7.17
0.5	-27.99	225	-6.66
0.75	-24.67	250	-6.92
1	-21.94	275	-7.48
2	-15.99	300	-6.68
3	-13.45	310	-6.82
4	-11.38	320	-6.84
5	-10.04	330	-6.82
6	-9.17	340	-6.91
7	-8.48	350	-7.28
8	-8.04	360	-8.07
9	-7.60	370	-9.19
10	-7.38	380	-10.33
25	-6.46	390	-11.25
50	-6.48	400	-12.21
75	-6.78		

Table1: Transfer impedance: 30 kHz to 400 MHz, typical data

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6 Ordering Information

Part Number	Description
TBSCP1-5M300	RF surface current monitoring probe, beech-wood box, calibration protocol 30 kHz – 400 MHz

7 History

Version	Date	Author	Changes
V 1.0	13.7.2022	Mayerhofer	Creation

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