



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.

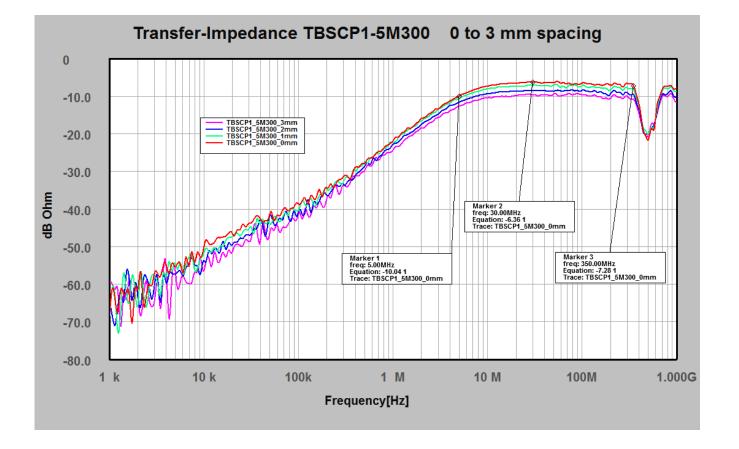
2 Specification

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





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.





RF SURFACE CURRENT MONITORING PROBE

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 dB Ω subtracted from the analyzer reading in dB μ V gives the corrected reading in dB μ A.

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

Frequency [MHz]	transfer impedance [dB Ω]	Frequency [MHz]	transfer impedance [dB Ω]
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





RF SURFACE CURRENT MONITORING PROBE

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

www.tekbox.com

TekBox Digital Solutions Vietnam Pte. Ltd.

Factory 4, F4, Lot I-3B-1, Saigon Hi-Tech Park, Tan Phu Ward, District 9, Ho Chi Minh City, Vietnam