

RF PULSE CURRENT MONITORING PROBE

1 Introduction

The TBPCP3-2H40 is an RF pulse current monitoring probe, expanding the Tekbox product range of affordable test equipment.

The probe has a 3 dB bandwidth from 2 Hz to 40 MHz and is characterized over the frequency range from 0.1 Hz to 100 MHz. The TBPCP3-2H40 is typically used for surge or RF pulse current monitoring applications in the time domain, in contrary to RF current monitoring probes designed for EMC applications, which are typically used for measurements in the frequency domain.



Picture 1: TBPCP3-2H40 current monitoring probe

The aperture of the RF current monitoring probe is 15 mm.

The transfer-impedance is $-20 \text{ dB}\Omega$ / 0.1 V/A when terminated with 50 Ohm and 0.2 V/A with a high impedance load. The typical 3dB bandwidth is 2 Hz to 40 MHz.

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2 Specification

Characterized frequency range: 0.1 Hz to 100 MHz
 3 dB bandwidth: 2 Hz to 40 MHz (measured in a 50 + 50 Ohm loop)
 Transfer impedance into 50 Ω load: -20 dB Ω ; 0.1 V/A
 Transfer impedance into high Z: 0.2 V/A
 Probe port impedance: 50 Ω
 Droop rate: 0.3% / ms
 Rise time: < 9 ns
 Max. RMS AC current: 40A
 Max. pulse current: 2000A
 Current time product: 0.1 Ampere seconds
 Max. core temperature: 80 °C
 Aperture diameter: 15 mm
 Outside diameter: 61 mm
 Height: 30 mm
 Weight: 320 g
 Connector type: N female; comes supplied with a coaxial adapter to BNC-female

3 Transfer impedance

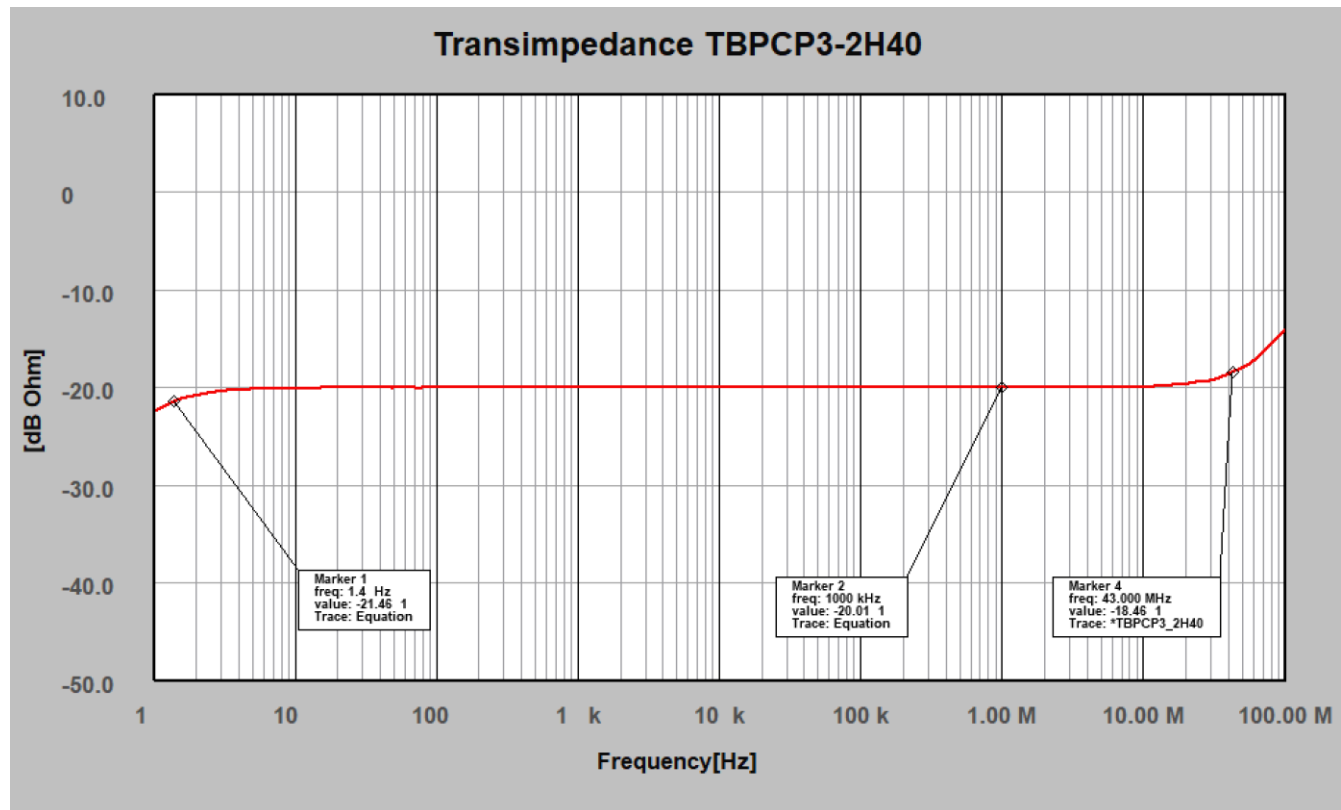


Figure1: typical transfer impedance, 0.1 Hz – 100 MHz

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4 Transfer impedance table

The table below shows typical transfer impedance data of a TBPCP3-2H40 pulse current probe. Each current probe is delivered with its corresponding measurement protocol. The transimpedance is measured with a 50 Ohm load.

Transimpedance [V/A] = $10^{(dB\Omega/20)}$ @ 50 Ohm

Transimpedance [V/A] = $2 \cdot 10^{(dB\Omega/20)}$ @ High Z

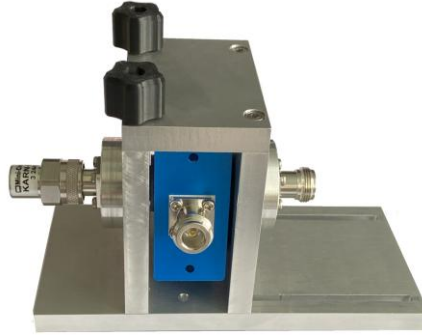
Frequency	transfer impedance [dBΩ] 50 Ohm load	transfer impedance [V/A] 50 Ohm load	transfer impedance [V/A] high Z load
1 Hz	-22,45	0,08	0,15
2,5 Hz	-20,59	0,09	0,19
5 Hz	-20,19	0,10	0,20
7,5 Hz	-20,13	0,10	0,20
10 Hz	-20,08	0,10	0,20
25 Hz	-20,05	0,10	0,20
50 Hz	-20,07	0,10	0,20
75 Hz	-20,08	0,10	0,20
100 Hz	-20,03	0,10	0,20
500 Hz	-20,05	0,10	0,20
1 kHz	-20,04	0,10	0,20
5 kHz	-20,04	0,10	0,20
10 kHz	-20,01	0,10	0,20
50 kHz	-20,04	0,10	0,20
100 kHz	-20,05	0,10	0,20
500 kHz	-20,05	0,10	0,20
1 MHz	-20,01	0,10	0,20
5 MHz	-20,00	0,10	0,20
10 MHz	-19,97	0,10	0,20
15 MHz	-19,81	0,10	0,20
20 MHz	-19,69	0,10	0,21
25 MHz	-19,47	0,11	0,21
30 MHz	-19,32	0,11	0,22
35 MHz	-19,02	0,11	0,22
40 MHz	-18,67	0,12	0,23
45 MHz	-18,33	0,12	0,24
50 MHz	-18,01	0,13	0,25
55 MHz	-17,70	0,13	0,26
60 MHz	-17,33	0,14	0,27
65 MHz	-16,89	0,14	0,29
70 MHz	-16,43	0,15	0,30
75 MHz	-15,99	0,16	0,32
80 MHz	-15,59	0,17	0,33
85 MHz	-15,21	0,17	0,35
90 MHz	-14,86	0,18	0,36
95 MHz	-14,53	0,19	0,38
100 MHz	-14,21	0,19	0,39

Table1: Transfer impedance: 0.1 Hz to 100 MHz, typical data

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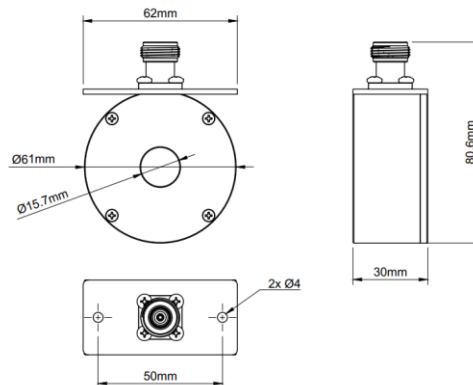
5 Calibration fixture

Tekbox supplies a calibrator suitable for the TBPCP3-2H40 current probe:



Picture 1: TBPCP3-CAL RF current probe calibration fixture

6 Dimensions



7 Ordering Information

Part Number	Description
TBPCP3-2H40	Pulse Current Probe 0.5Hz – 30 MHz, N-male to BNC-Female adapter
TBCP3-CAL	Calibration fixture for TBPCP3 series pulse current probes

8 History

Version	Date	Author	Changes
V 1.0	6.7.2025	Mayerhofer	Creation

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