Differential Amplifier

1 Introduction

The TBCS101-DA is a differential amplifier with a flat response from DC – 250 MHz, a 3 dB bandwidth of 310 MHz, an attenuation of 1:50 and an output impedance of 50Ω.

Application:

Differential amplifier for CS101 test setups.

General-purpose differential amplifier

2 Specification

General specification

Frequency range:	DC – 310 MHz, 3 dB bandwidth, typical
Gain:	1:50
Rise time:	≤ 2.3 ns (200mV step)
RF-connectors:	BNC-female

Input specification

Input impedance:	1 MΩ // 10pF
Maximum input level:	max. ± 50 V for linear operation (100V differential mode)
Maximum ratings:	max. ± 100 V common mode / 200 V differential mode for damage

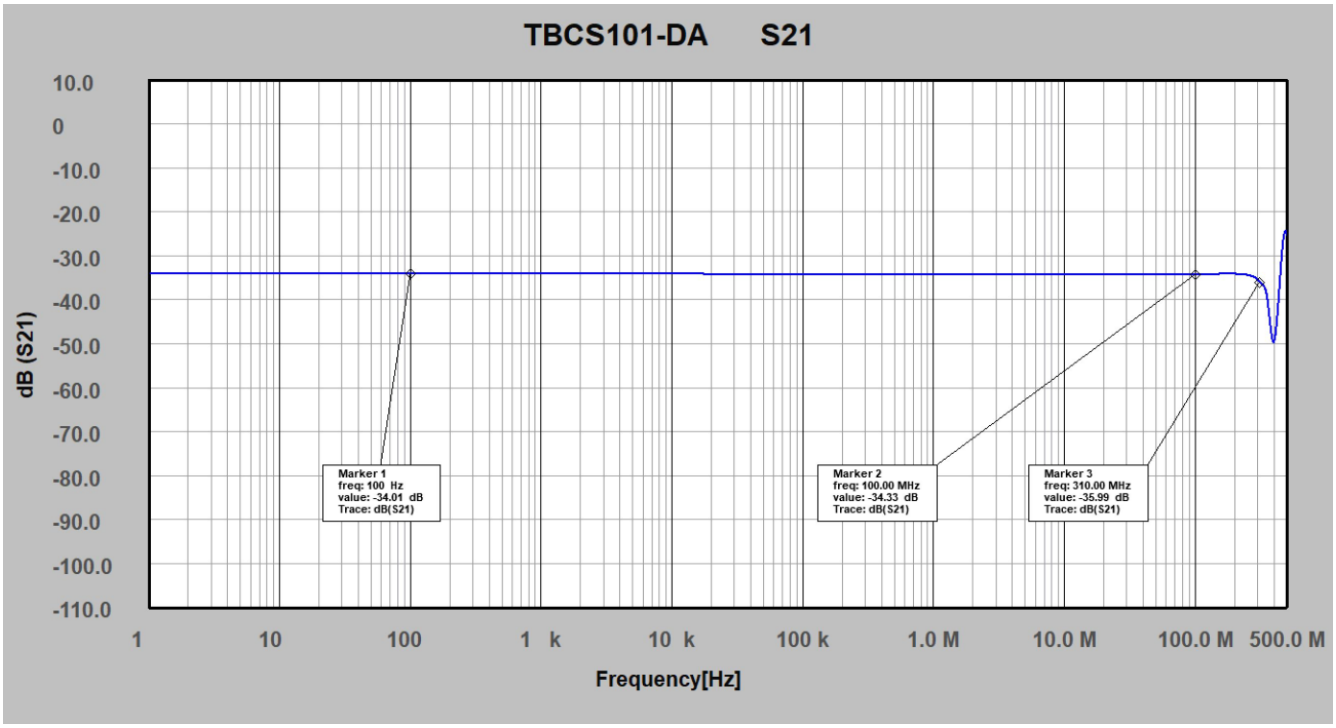
Output specification

Output impedance:	50 Ω
Output return loss:	> 20 dB, typ.
Common Mode Rejection:	DC – 1 MHz > 70 dB; 1 MHz – 100 MHz ≥ 80 dB; 100 MHz – 310 MHz ≥ 50 dB

Max. output voltage:	2 V_{pp}
DC offset:	< 10mV at output
Noise:	< 1.4 mV_{RMS}
Supply specification	
Power-connector:	USB-C
Indicator LEDs:	Power ON,
Operating voltage:	5 V DC
Current consumption:	90 mA
Operating temperature range:	-20°C to +50°C
Dimensions:	W 82 mm x H 33 mm x L 80 mm;
Weight:	100 g

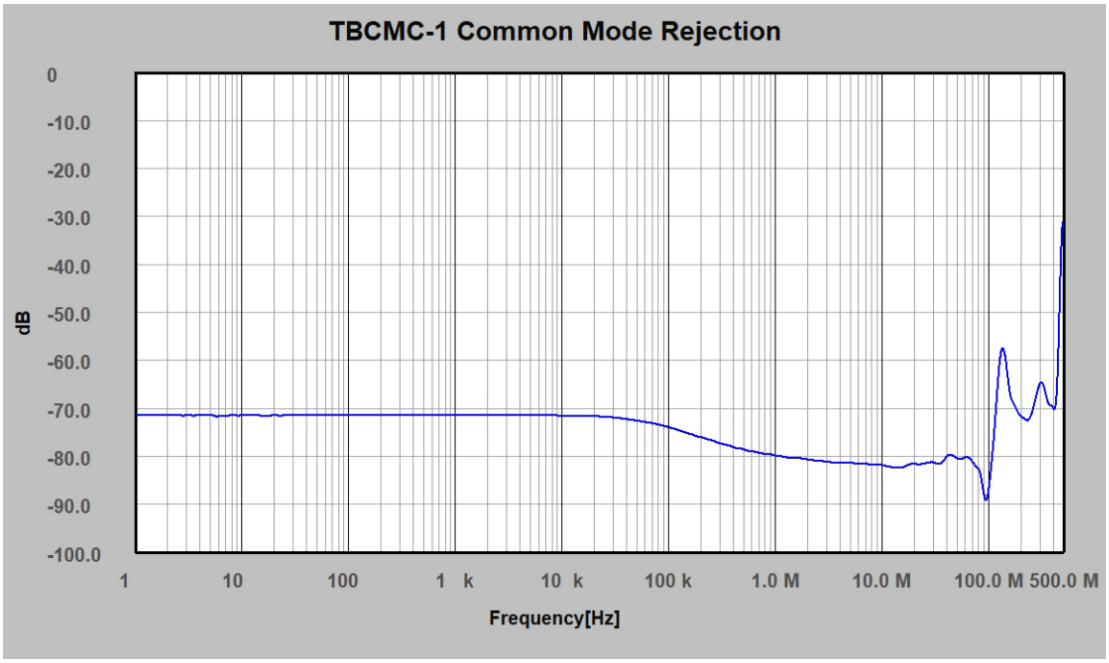
3 Measurement Plots

3.1 Gain



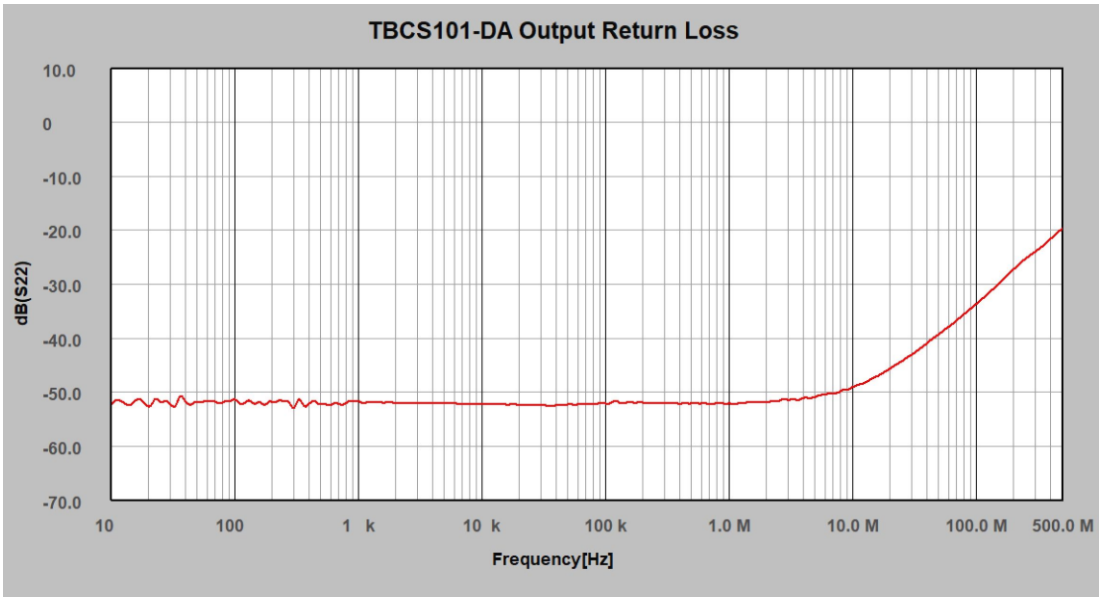
TBCS101-DA, Gain, DC – 500 MHz, typ.

3.2 Common Mode Rejection



TBCS101-DA, Common Mode Rejection, DC – 500 MHz, typ.

3.3 Output return loss



TBCS101-TGA, S22, 10 Hz – 500 MHz, typ.

4 Ordering Information

Part Number	Description
TBCS101-DA	Differential amplifier, USB-C cable

5 History

Version	Date	Author	Changes
V1.0	2. 3.2025	Mayerhofer	Creation of the document