

Injection Transformer



1 Introduction

The TBJT03 is an injection transformer for CS101 related immunity measurements in the frequency range 150 kHz – 50 MHz. It provides galvanic isolation and high pass filtering between the signal source and EUT supply lines.



Picture 1: TBJT03 injection transformer

2 Specification

Compliance:	RoHS
Impedance:	50 Ω
Turns ratio:	1:1; 56nF Y2 coupling capacitor on the EUT side
Characterized freq. range:	10 Hz to 100 MHz
3 dB frequency range:	50 kHz – 50 MHz typ.
Insertion loss (S21):	3 dB max. @ 50 MHz
Max. RF power rating:	20W
Output voltage rating:	300V AC @ 50/60 Hz, 210V AC @ 400 Hz; 500V DC
Residual 50 Hz voltage:	40 mV at the input connector (high Z) @ 240V AC at the secondary terminals
Isolation test, EUT - Input:	2500V, 22 G Ω
Primary connector (Input):	BNC-Female
Secondary connectors (EUT):	4 mm safety banana jacks, 20 mm spacing
Operating temp. range:	0°C – 50°C
Enclosure dimensions:	70 mm x 60 mm x 140 mm
Weight:	300 g

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3 Frequency response

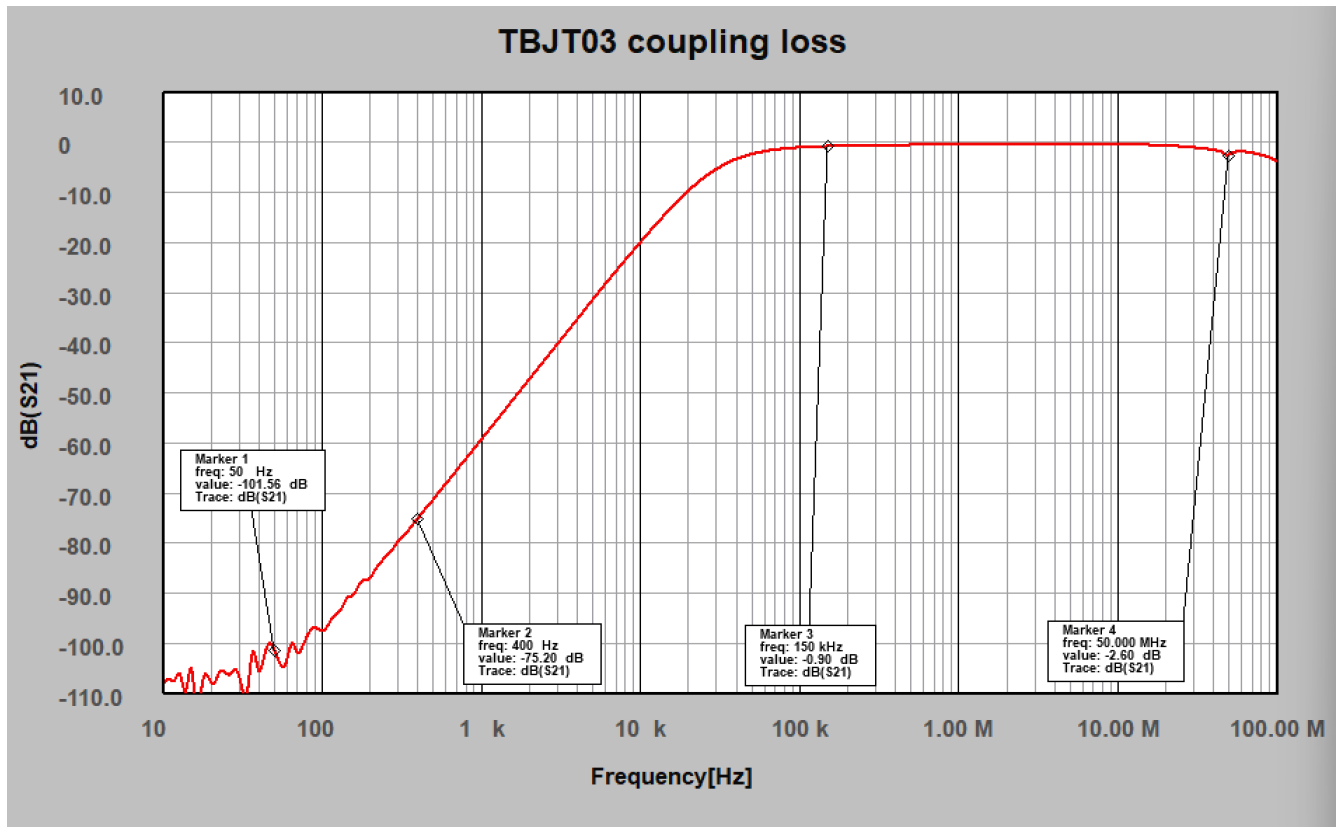
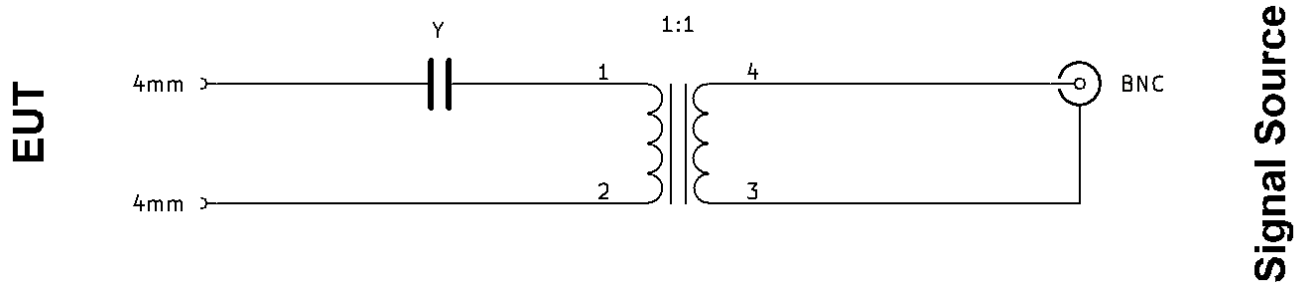


Figure 1: typical insertion loss

4 Schematic



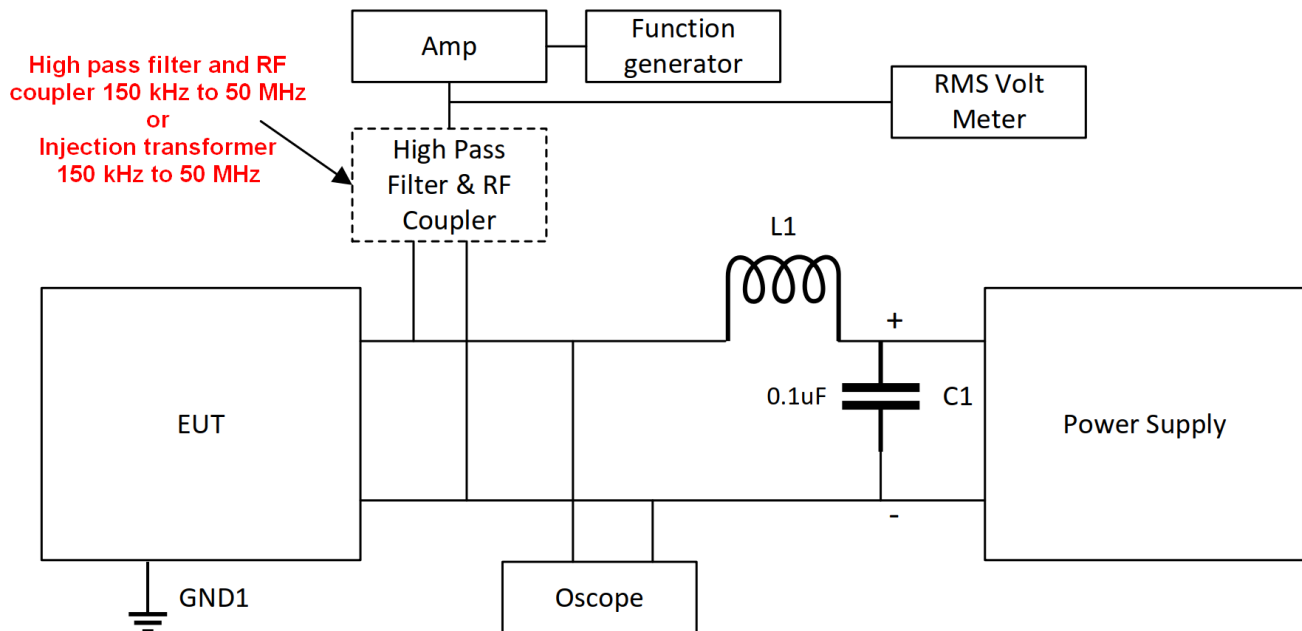
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5 Application

MIL-STD-461G CS101 defines susceptibility testing for power leads in the 30 Hz to 150 kHz frequency range.

Various manufacturer standards extend the test coverage to include frequencies ranging from 150 kHz to 50 MHz.

Setup:



Freq (Hz)	MIL-STD-461F CE102(dBuV)	Frequency (Hz)	MIL-STD-461F CS101 Curve #2	Frequency (Hz)	Tailored CS101 & CS02 Voltage (dBuV)	Injection Voltage (Vp-p)	Injection Voltage (Vrms)
10.0E+3	94.0E+0	30.0E+0	126.0E+0	30.0E+0	119.9E+0	2.8	0.989949
500.0E+3	60.0E+0	5.0E+3	126.0E+0	1.0E+3	119.9E+0	2.8	0.989949
10.0E+6	60.0E+0	150.0E+3	96.5E+0	5.0E+3	119.9E+0	2.8	0.989949
				150.0E+3	116.1E+0	1.8	0.636396
				1.0E+6	111.0E+0	1	0.353553
				50.0E+6	111.0E+0	1	0.353553

Warning:

Set up a suitable low pass filter C1/L1 to protect the power amplifier output from power-on/off transients.

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6 Ordering Information

Part Number	Description
TBJT03	150 kHz – 50 MHz injection transformer

7 History

Version	Date	Author	Changes
V 1.0	9.5.2025	Mayerhofer	Creation