FIT1045A: Small-Signal Wideband Injection Transformer, Optimized for Loop Response Characterization

Product Description

The FIT1045A is a small-signal injection transformer that has been optimized for control loop stability testing over a wide frequency range. This transformer provides isolation between expensive benchtop test instrumentation (such as a VNA or a Frequency Response Analyzer) and a device under test (DUT), while introducing minimal parasitic loading to preserve measurement fidelity. This transformer offers a wide usable bandwidth, low parasitic capacitance, high common-mode voltage withstanding, and is densely packaged in a rugged powder-coated (scratch resistant) enclosure.

While occupying less than half the bench space of products with similar bandwidths, the FIT1045A offers best-in-class saturating current limits, despite being a physically smaller device.

This transformer has a rugged and sturdy build, ensuring stability on your benchtop. The FIT1045A was designed and is assembled in the United States of America by Blue Dot Laboratories LLC. For additional information, tutorials, and application notes, visit www.bluedotlaboratories.com.

Specifications

Absolute Maximum Ratings

Working Voltage	500 Vrms
Fuse I_{max}	250 mA
Ambient Temperature	-40C – 85C

Typical Characteristics (25C)

Transformer Ratio	1:1
DC Winding Resistance	450 mΩ
Fuse cold resistance (resistance when operated below saturation)	0.577 Ω
Saturation Current (DC current at which winding inductance drops 10% at 10 kHz)	14.75 mA
Interwinding Capacitance (F_{test} = 3 MHz)	85 pF
Usable Bandwidth [1]	10 Hz to 45 MHz

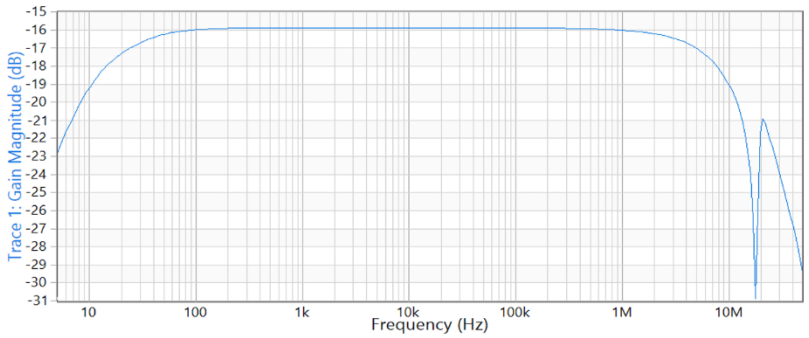
Mechanicals

Input Connector Type	BNC
Output Connector Type	BNC
Weight	240 g
Width/Length/Height	69mm/119mm/38mm

Characteristic Curves [2]

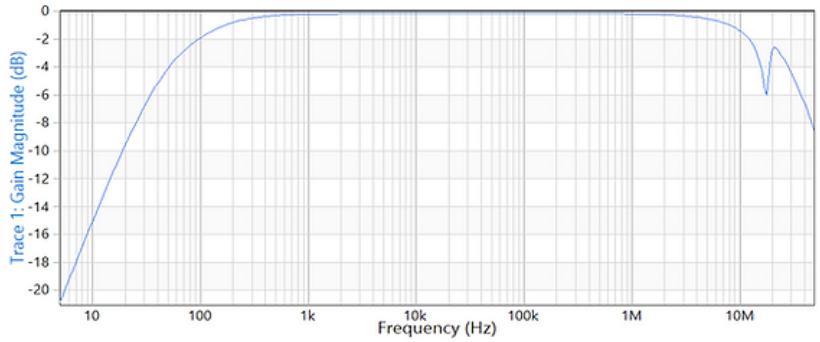
S21 (typical)

25C lab ambient
1 Hz – 50 MHz
50 Ω source impedance
5 Ω terminating impedance



S21 (typical)

25C lab ambient
1 Hz – 50 MHz
50 Ω source impedance
50 Ω terminating impedance



Notes

[1] Injection transformers designed for loop stability applications do not typically specify -3dB bandwidth because -3dB bandwidth is heavily dependent on the in-application source and load termination. Additionally, to a first order approximation, passband flatness is not critical for loop response measurements because the computed response depends on the ratio of voltages across the secondary, effectively "removing" the transformer response from the measurement. For this reason, a "usable bandwidth" specification has been adopted in industry. For a more detailed understand of transformer bandwidth, see the characteristic curves section.

[2] Characteristic curves represent nominal behavior and are meant for reference only.

Questions?

For a swift response, send all inquiries to hello@bluedotlaboratories.com/