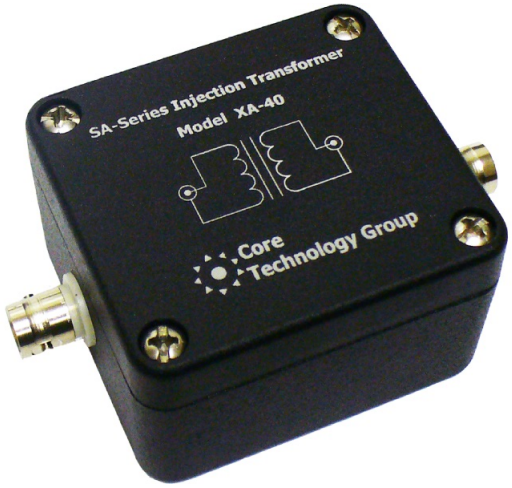
Core Technology Group

XA-40

Signal Injection Transformer



Features

Lightweight/Portable
1 Hz to10 Mhz BW usable to 40 Mhz
BNC attachment to instrument
Fast connect/disconnect
Isolated BNC connectors
All metal housing

Applications

Bode plot measurements
Power supply stability analysis
Control system modeling
Positioning system control studies
Amplifier feedback characterization
Gain and phase margin measurements
Production testing

General Description

The XA-40 is a transformer used to isolate and inject a test signal into the feedback path of a control system. The XA-40 works in conjunction with the SA Series Analyzer and a set of standard probes providing a flexible setup for studying feedback characteristics and stability of power supplies, amplifiers & filters. Its small size and weight make it ideal for field applications as well.

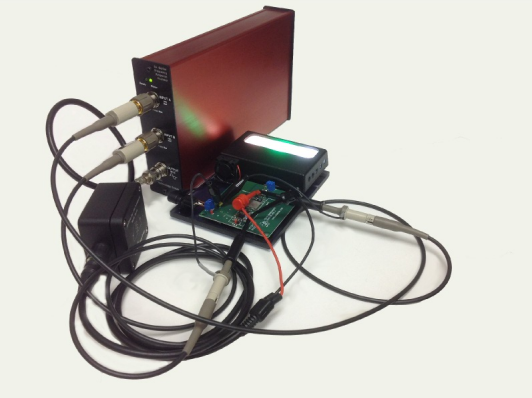


Figure1. Measuring feedback loop response of switching power supply with XA-40 & probes.

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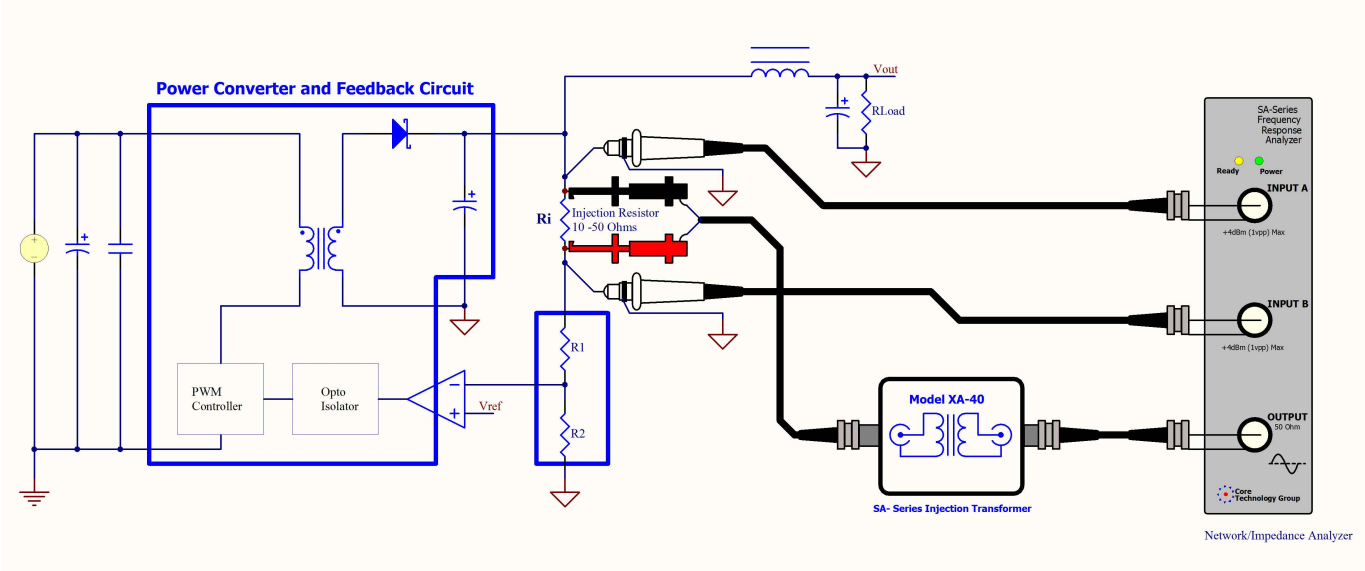

Figure 1. The XA-40 in a typical test setup measuring feedback control loop parameters or Bode Plots for a switching power supply.

When making feedback control system measurements, such as in switch mode power supply, speed control and positioning system design, it is very important to characterize the stability of the control loop to insure that there is enough gain for accuracy and phase margin for stability. In most cases, an isolation transformer and vector network analyzer are necessary to make these measurements.

The XA-40 Injection Transformer was designed to provide maximum flexibility to the designer for making feedback control system measurements.

Figure 1. shows a typical test setup to measure the open loop gain of a switching power supply using the XA-40 to inject a test signal into the loop and an SA Series Vector Network analyzer to gather the data and display the loop characteristics on a bode diagram.

Basically, a small test signal is injected into the feedback loop at a given frequency and the loop response to that test signal is measured and recorded. This is done over a specified frequency range and gives the designer a complete graph of the feedback system response. This graph, or bode diagram, is used to indicate the stability of the system and the DC accuracy.

The XA-40 is ideal for the lab as well as the production environment. Additionally, it is lighweight and compact enough to carry into the field. It is configured with standard connector types that can be easily extended for added flexibility.

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