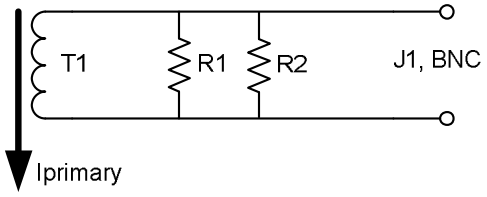
Current Monitor Board 1.0

Introduction

The Current Monitor Board 1.0 is designed for use as a monitoring and troubleshooting tool for DRSSTC and other pulsed power systems. This board features a single 500A wideband current transformer which provides high accuracy measurements. There is both an onboard 0.5 watt and 2 watt resistor, R1 and R2, which can be utilized as a burden resistor. A BNC output connector is provided for easy connection to an oscilloscope or other similar monitoring device.

Typical Applications:

- DRSSTC and SSTC systems
- Current Sense Circuits
- Pulse Current Monitor
- Low-to-Mid Power DRSSTCs



Schematic Diagram

Electrical Properties	
Bandwidth	20kHz – 200kHz
Max. Current (peak)	> 500A
Max. Current (RMS)	> 110A
Number Turns	100
Inductance	14mH
R1, Max. Power	0.5W
R2, Max. Power	2W

Selecting R1 and R2, Burden Resistor

Selection of the R1or R2, burden resistor should be done using the following formula:

Volts/Amp = R1 / Number of Turns

For example, if we used a burden resistor of 1 ohm, then our calculated Volts / Amp would be:

Volts/Amp = 1 / 100 = 0.01V/A

So with a DRSSTC that operates with a peak current of 500A, the output of this current transformer would be:

Voutput = (Ipulse x R1) / Number of Turns

= (500A * 1) / 100 = 5V

Burden Resistor Power Dissipation

Power dissipation of the burden resistor, R1 or R2, can be approximated with the following equation:

$Pdiss = (Voutput^2 / R1) \times DC$

(where DC = duty cycle of DRSSTC system)

Generally, DRSSTCs operate at very low duty cycles, typically 5-10% maximum duty cycle. So, if we have a DRSSTC that operates with a peak output current of 500A and the maximum operational duty cycle is 5%, the maximum power dissipation of the burden resistor, R1 would be:

$Pdiss = (5V^2 / 1) \times 0.05$

Pdiss = 1.25 watts

The maximum power dissipation of the onboard burden resistor, R1 is 2 watts so this value of burden resistance is acceptable.