The Application of Single Wire Phase Retardation Effect in Power Source

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Abstract

In this work, we combined a power source with a single wire phase retarded circuit in parallel. When a load resistor is connected to this combination, the single wire phase retarded circuit supplies most current to the load resistor so that the supplied current from the source is reduced. It is observed that the consumed power in the load resistor is larger than the supplied power from the source. It is anticipated that this technology can be used to generate electric power.

Keywords: *power source, single wire phase retardation, power generation*

Introduction

The effect of phase retardation in single wire has just been verified in experimental measurement [1] based on previous analyses [2-5]. It is found that the current through a single wire phase retarded circuit is phase inverted when the source is working within specific regions of frequency. In this work, we build a combined source using the retardation circuit. Our purpose is to verify that the phase inverted current from the retardation circuit could flow into the load resistor.

Methods

The schematic of the combined source and load resistor is shown in Fig.1. The source V is a function generator (MADELL CA 1640-20). A single wire D is connected between transformer T_1 and T_2. The length of D is 32.6 meter. The value of Rd is 10 ohm. The value of R_L is 11 ohm.

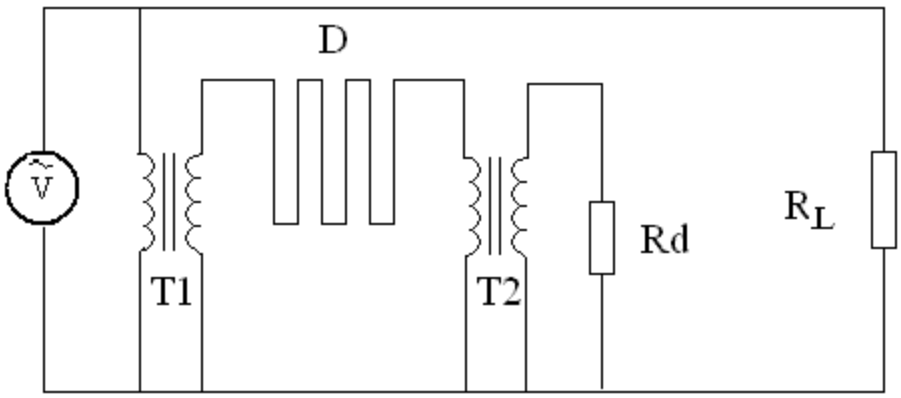

Figure 1: Schematic of combined source with single wire phase retarded circuit.

The above diagram is equivalent to the circuit in Fig. 2. The retardation component is equivalent to a negative resistor R'd, which has effective value of –11 ohm. The current Id is phase inverted so that it offset the current I_L to the load resistor. The current Iv from the source is equal to

$$\hat{I}_v = \hat{I}_L - \hat{I}_d \tag{1}$$

Since the value of Iv can be canceled out to a small value or negative value, the supplied power from the source could be much smaller than the consumed power in the load resistor.

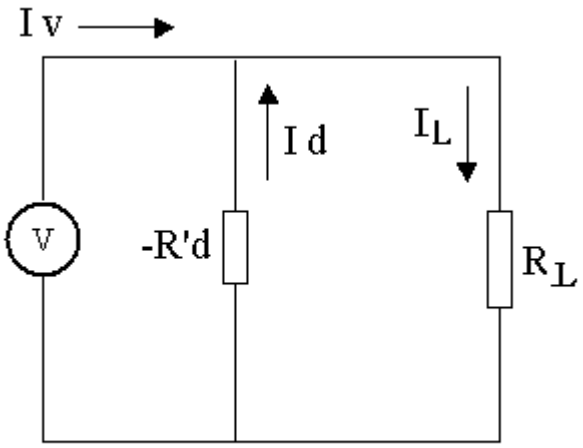

Figure 2: The equivalent circuit of the combined source and load resistor.

Results

The working frequency is 1.324 MHz. The source voltage V is 0.8 Volt. The value of Id is 106 mA. The value of I_L is 116 mA. The value of Iv is 52 mA. The phase difference between Iv and V is 30 degree. The consumed power in R_L is 148.0 mW. The power supplied from the source is 36.0 mW.

Conclusion

The current through a single wire phase retarded circuit is phase inverted. When such a retardation circuit is combined with a power source, it can supply current to the load resistor. The current supplied from the source is reduced so that the consumed power in the load resistor is much larger than the supplied power from the source.

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