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# The Graphical Analysis of the Transistor Square-Wave Oscillator

Takaya MARUOKA\*

The transistor square-wave oscillator called Royer oscillator consists of two transistors, some resistors and a transformer whose core has the characteristic of square  $B-H$  hysteresis loop, and is used for  $DC$  to  $AC$  inverters and  $DC$  to  $DC$  converters.

This paper gives, assuming the wave form of the oscillator is perfectly square, the graphical method to determine the dynamic characteristics of Royer oscillator and these characteristics are attained by the points determined from the intersection of an operation curve and a load curve which are drawn on the  $V_{ce}-I_c$  characteristics of the transistor.

Output voltage, output current, output power, input power, efficiency, frequency, collector loss, feed-back loss and hysteresis loss are calculated simply from the operating point. The wave forms of voltage and current of the transistor can be calculated from the operating point moving around the  $B-H$  hysteresis loop.

The calculated results are confirmed by the experiments and this method is recommended to be used in designing of inverters and converters.

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