

A VOLTAGE REFERENCE CIRCUIT FOR CURRENT SOURCE OF RFIC BLOCKS

Abstract

Purpose - The purpose of this paper is to design a voltage reference circuit for current source of radio frequency integrated circuit blocks. The voltage reference circuit is called voltage for current source (VCS). **Design/methodology/approach** - The circuit concept is discussed. A voltage-controlled oscillator (VCO) and buffer circuit together with VCS circuit are built to prove the concept. Though the VCS circuit employs no array of diode like standard bandgap circuit, it still employs the concept of proportional to absolute temperature (PTAT) and a complement to absolute temperature (CTAT) elements. The integrated VCO, together with VCO core and VCO buffer circuits, are designed for W-CDMA application particularly for the demodulator section. All circuits are built in $f_T=45$ GHz SiGe BiCMOS process. **Findings** - At 760 MHz the power consumption for core circuit is 0.6 and 3.3 mA for VCO buffer amplifier. The fabricated VCO circuit together with VCO buffer was tested and measured with VCO output of -6 dBm at 760 MHz with variation of 0.1 dBm across -40°C to 85°C . **Originality/value** - A voltage reference circuit which is derived from PTAT and CTAT current generators is presented. The circuit is capable of providing a constant current across absolute temperature or a current PTAT