A 380-MHz CMOS Linear-in-dB Signal-summing
Variable Gain Amplifier with Gain Compensation
Techniques for CDMA Systems

Osamu Watanabe, Shoji Otaka, Mitsuyuki Ashida and
Tetsuro Itakura
Corporate R&D Center, Toshiba Corporation
1 Komukai Toshiba-cho, Saiwai-ku, Kawasaki 212-8582,
Japan

Abstract
A linear-in-dB signal-summing VGA is fabricated in 0.25 μm CMOS tech-
nology. Two gain compensation techniques are proposed in order to com-
pensate the gain deviations due to a MOSFET characteristic which has a
square-law characteristic or a exponential-law characteristic determined
by its current density. Temperature compensation techniques are also
proposed. A gain range of 80 dB, a gain-error of within ±3 dB, an NF of
11 dB were obtained at 380 MHz by measurement.