RF Power Detector Increases Wireless Coverage and Extends Battery Life

A new linear root-mean-square (RMS) radio frequency (RF) power detector from National Semiconductor Corporation offers very high precision with up to 40 dB dynamic range.

The PowerWise® LMH2120 increases wireless coverage and extends battery life for third-generation (3G) and fourth-generation (4G) mobile handsets.

National's LMH2120 linear RMS RF power detector enables accurate RF power amplifier (PA) measurements, which are used to control transmit power and avoid interference with neighboring signals. The LMH2120 provides stable performance over the full temperature range of -40°C to 85°C, with a temperature variation of just +/-0.5 dB over a wide 40 dB dynamic range at 1900 MHz, minimizing guard bands. This feature increases coverage and quality of service, such as higher uplink data rates at greater distance from the cell tower.

The LMH2120's performance remains consistent across various modulation schemes in multi-mode handsets and data cards using CDMA, W-CDMA, UMTS, LTE, GSM and GPRS cellular standards. It provides modulation-independent measurements of less than 0.3 dB, which eliminates the extensive look up tables required for accuracy. The LMH2120 also includes a shutdown pin for reducing power consumption in between measurements to extend handset battery life.

The LMH2120 linear RMS RF power detector operates from a single 2.7V to 5V supply and provides an output voltage proportional to the RF input power in dBm. This minimizes the need for extra calibration and reduces the resolution requirement for the system's analog-to-digital converter.

Handset designers can connect the LMH2120 to the output of the PA with a directional coupler or a resistive tap. The LMH2120 features a supply current of 2.9 mA and includes a low-power shutdown-mode that reduces power consumption to 3.8 uA. It supports frequencies of 50 MHz to 6 GHz, with an RF power detection range of -35 dBm to 5 dBm.

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