HARRIS SEMICONDUCTOR

HSP50307

December 1996

Burst QPSK Modulator

Features

- 256 KBPS Data Rate and 128 KBPS Baud Rate
- Burst QPSK Modulation
- Programmable Carrier Frequency from 8MHz to 15MHz With a Frequency Step Size of 32kHz
- α = 0.5 Root Raised Cosine (RRC) Filtering For Spectrum Shaping
- On-Board Synthesizer
- Programmable Output Level From 22 to 62dBmV in 1dB Steps
- Programmable Charge Pump Current Control
- 62dBmV Differential Output Driver for 75Ω Cable

Applications

- Burst QPSK Modulator
- HSP50307EVAL1 Evaluation Board Is Available

Ordering Information

PART NUMBER	TEMP. RANGE (°C)	PACKAGE	PKG. NO.
HSP50307SC	0 to 70	28 Ld SOIC	M28.3

Description

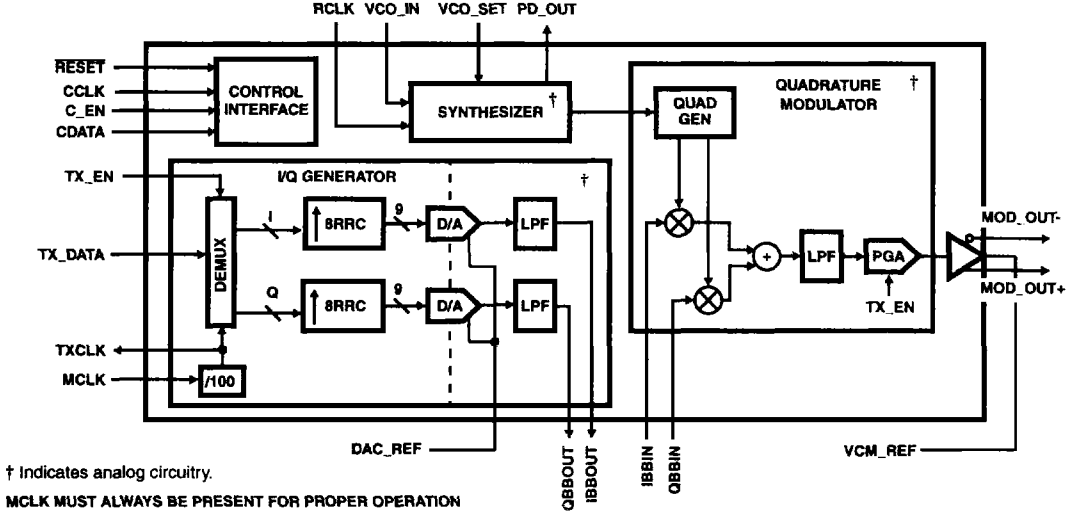
The HSP50307 is a mixed signal burst QPSK Modulator for upstream CATV Applications. The HSP50307 demultiplexes and modulates a serial data stream onto an RF Carrier centered between 8 and 15MHz. The signal spectrum is shaped with α = 0.5 root raised cosine (RRC) digital filters. On-chip filtering limits spurs and harmonics to levels below -35dBc during transmissions. The output power level is adjustable over a 40dB range in 1dB steps. The maximum differential output level is +62dBmV into 75Ω. A transmitter inhibit function disables the RF output outside the burst interval. The differential output amplifier interfaces to the cable via a transformer.

The block diagram of the HSP50307 QPSK Modulator is shown below. The HSP50307 consists of a digital control interface, an I/Q generator, a synthesizer, and a quadrature modulator.

The data clock is derived from the master clock. The HSP50307 demultiplexes the input data bits into in-phase (I) and quadrature (Q) data streams. The first bit and subsequent alternating bits of the burst are in-phase data. The two data streams are filtered, converted from digital to analog, and low pass filtered to produce the baseband I and Q analog signals.

The baseband signals are up-converted to RF in the quadrature modulation section The synthesizer provides the local oscillator (LO) for the quadrature modulator. The frequency is programmable via the control interface with a resolution of 32kHz. The output of the quadrature modulator is low pass filtered to remove harmonic distortion.

Block Diagram



† Indicates analog circuitry.

MCLK MUST ALWAYS BE PRESENT FOR PROPER OPERATION

CAUTION: These devices are sensitive to electrostatic discharge. Users should follow proper IC Handling Procedures.

File Number 4219