Design Considerations for Using the PE3236 in the Qualcomm Q0420 Evaluation Kit

Introduction

Peregrine Semiconductor offers an Evaluation Kit specifically designed for evaluating the PE3236. The PE3236 Evaluation Kit allows maximum flexibility for optimizing phase noise, spur, lock time, and power performance for specific applications. Using the hardware and software provided in the PE3236 Evaluation Kit, all modes of PE3236 operation including serial, parallel, direct, and enhancement modes of programming can be demonstrated.

In addition, the PE3236 can be evaluated in existing Q3236 applications. To evaluate the PE3236 using the Q0420 Evaluation System for the Q3236, make the following Q0420 hardware modifications. These changes allow evaluation with serial, parallel and direct modes of programming:

Features

- Allows for quick evaluation of PE3236
- PE3236 offers 10 dB of phase noise improvement over Q3236
- PE3236 consumes only one-tenth the power of Q3236
- These advantages are achieved without any penalty in reference spurs, lock time, or temperature stability

1. The PE3236 is a 3-volt part. To accommodate this, PE3236 V_{DD} pins 1, 11, 12, 23, 31, 33, 35, 38 should be supplied with 3 V. To implement this change, add a 1500-Ohm resistor in parallel with C_{15} on the Q0420 board. Verify this change by measuring the voltage at the PE3236 V_{DD} pins before installing the PE3236 in the socket. WARNING: the Absolute Maximum Rating for V_{DD} is 4.0 V.

2. The PE3236, unlike the Q3236, contains no mode for backwards compatibility to Q3036. Pin 44 must always be set to V_{DD} by connecting a short between jumper JP7 pins 1 and 2.

3. To use the divide-by-two prescaler provided on the Q0420 board, 5 V must be supplied to U11. Apply an external 5 V supply through JP12 pin 2. For additional information on enabling and disabling the divide-by-two prescaler, refer to section 2.3.6 in the Q0420 User's Guide.

4. PE3236 GND pins 6, 17, 29, 40, 41 should be ground. To accomplish this, replace C42 on the Q0420 board with a zero ohm jumper.

5. Direct mode programming requires an additional pull-up resistor to pin 22. This can be implemented by connecting a 10 Kohm resistor between pin 22 and pin 23 at the terminals of C83 (or C82) and C59. (Capacitor C59 is not labeled on the board; it is adjacent to S1 between S1 and S2.) The pull-up resistor can be left on the board without affecting register programming via the two bus modes.

6. The PE3236 uses 3-volt CMOS logic. To use serial or parallel mode programming, conversion from 5-volt logic to standard 3-volt CMOS logic is recommended. WARNING: the Absolute Maximum Rating for Voltage on Any Input, is VDD + 0.3 V.

7. The PE3236 provides 3-volt CMOS logic on output pins 30, 36, 37 and 39. The Q0420 board is designed for ECL logic and provides ECL loads, R43, R49, R50 and R59. If these loads are not removed for use with the PE3236, then R51 should be adjusted to minimize spurious sidebands caused by mismatch in these ECL loads.

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Application Note Identification