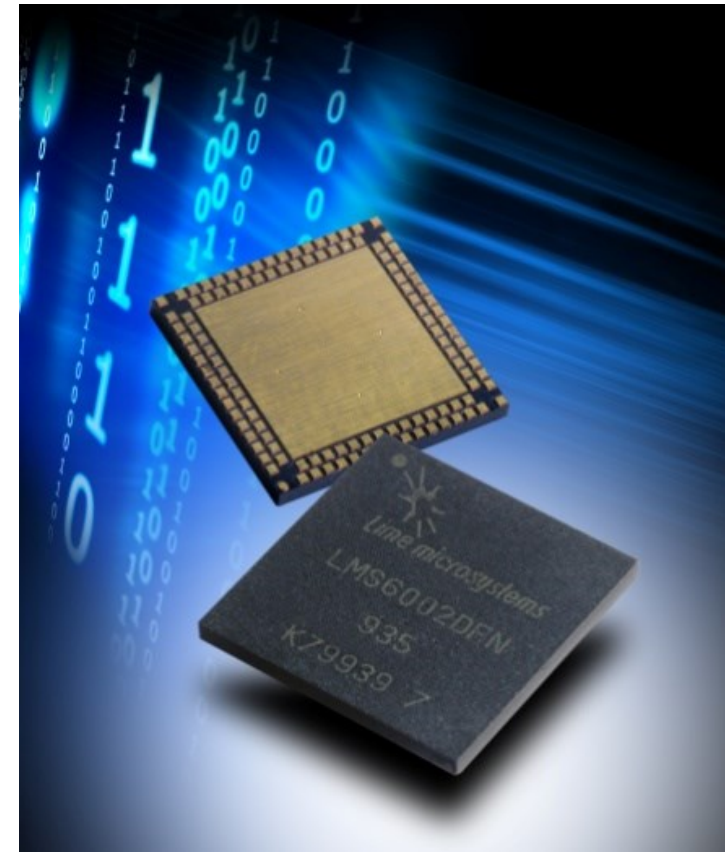


LMS6002D PLL Settling time

Measured on evaluation board with 100KHz and 200KHz Loop Filter



Setup

LMS6002DFN settings:

| | |
|------------------|-------------------|
| Rx PLL frequency | 1950MHz |
| Active LNA | LNA2 |
| LNA gain | Max Gain |
| LPF BW | 10MHz |
| ICP | 1200uA and 2400uA |

| | |
|------------------|-------------------|
| Tx PLL frequency | 1950MHz |
| LPF BW | 10 MHz |
| ICP | 1200uA and 2400uA |

| | |
|--------------------|----------|
| FDD/TDD Selection | TDD |
| TDD Mode Selection | Variable |

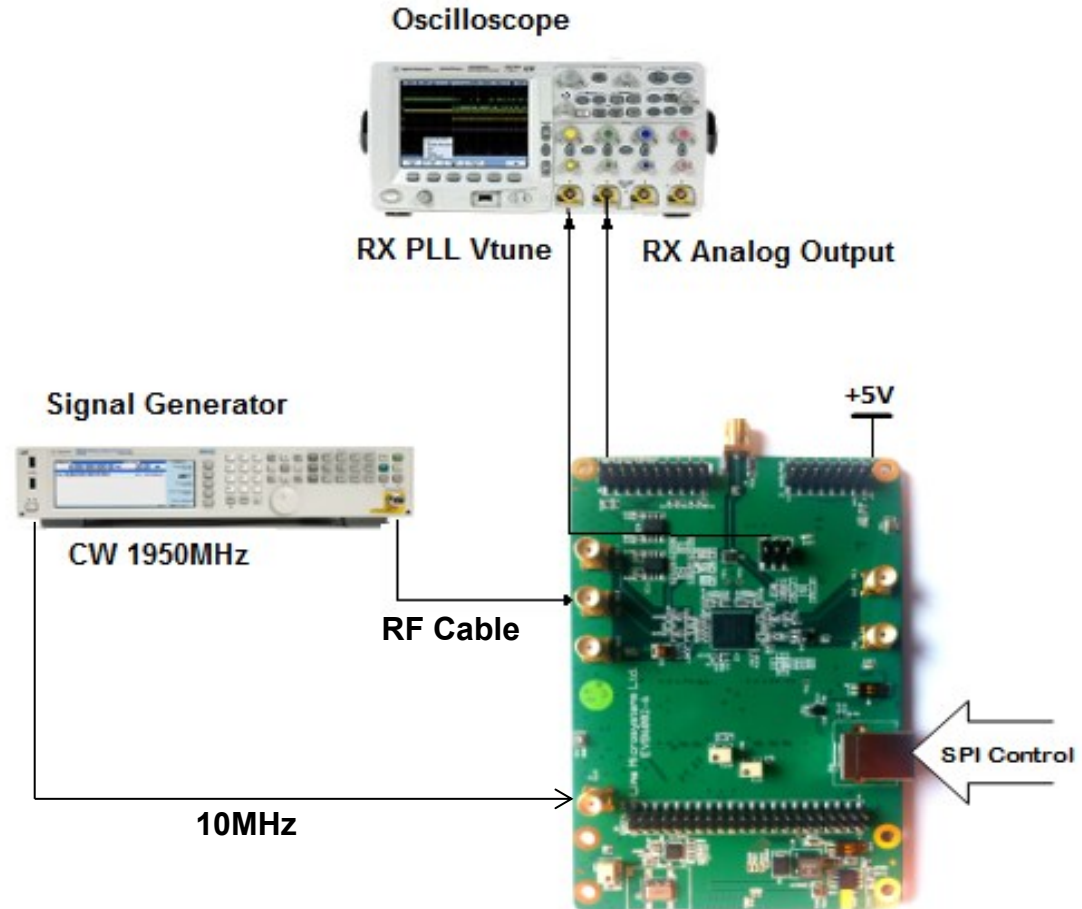
Hardware modification:

TXVDDVCO18 (pin 60) and RXVDDVCO18 (pin 84) to single 1.8V supply via 22 Ohm.

PLL Loop Filter BW:
100KHz
200KHz

Generator settings:

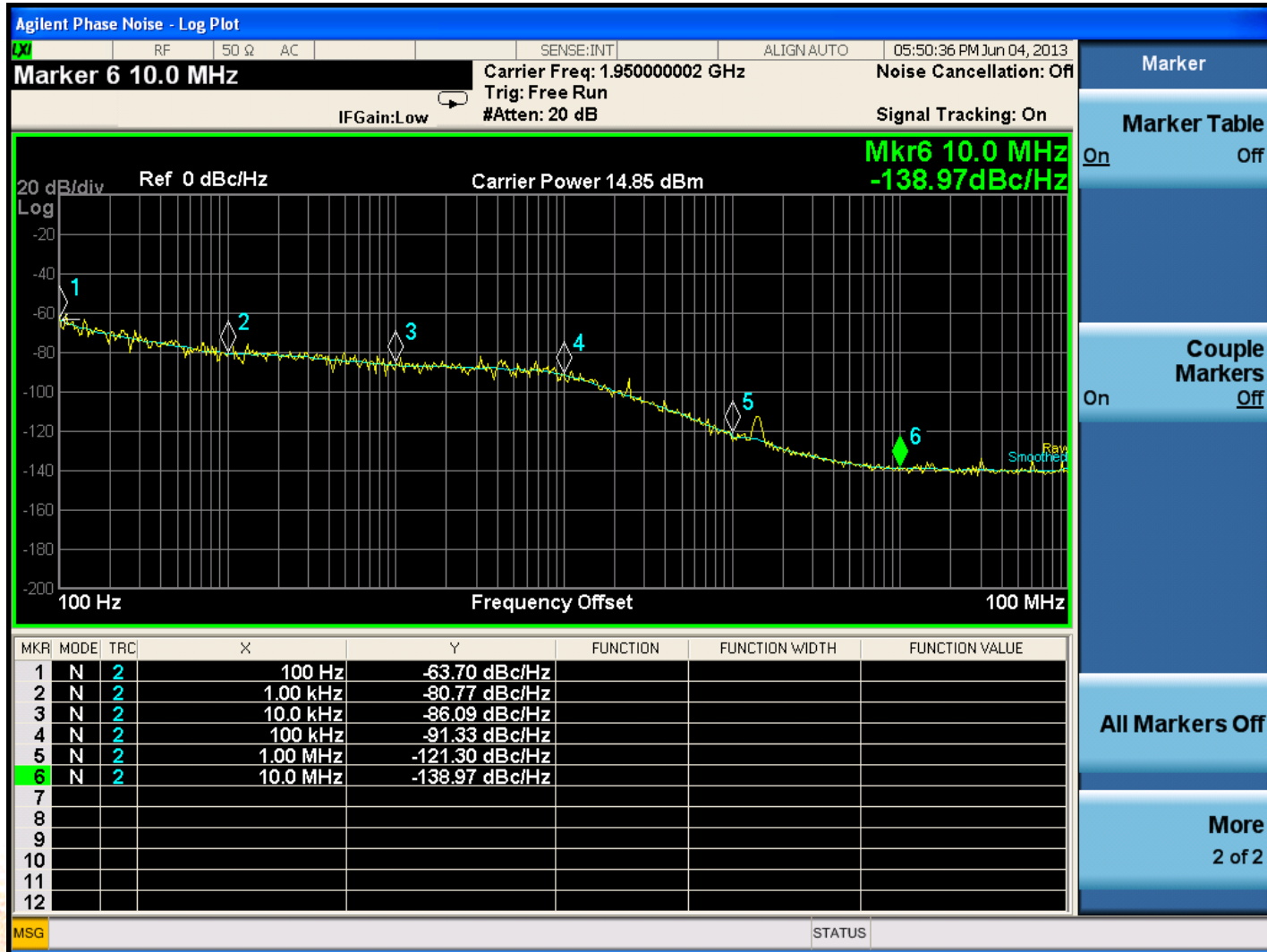
| | |
|------------|---------|
| Frequency | 1950MHz |
| Amplitude | -60dBm |
| Modulation | CW |



100KHz Loop Filter Measurements

Charge Pump Current set to **1200uA**

Phase Noise with 100KHz Loop Filter



Integrated Phase Noise with 100KHz Loop Filter



Integrated Phase Noise
– 1.148 Deg

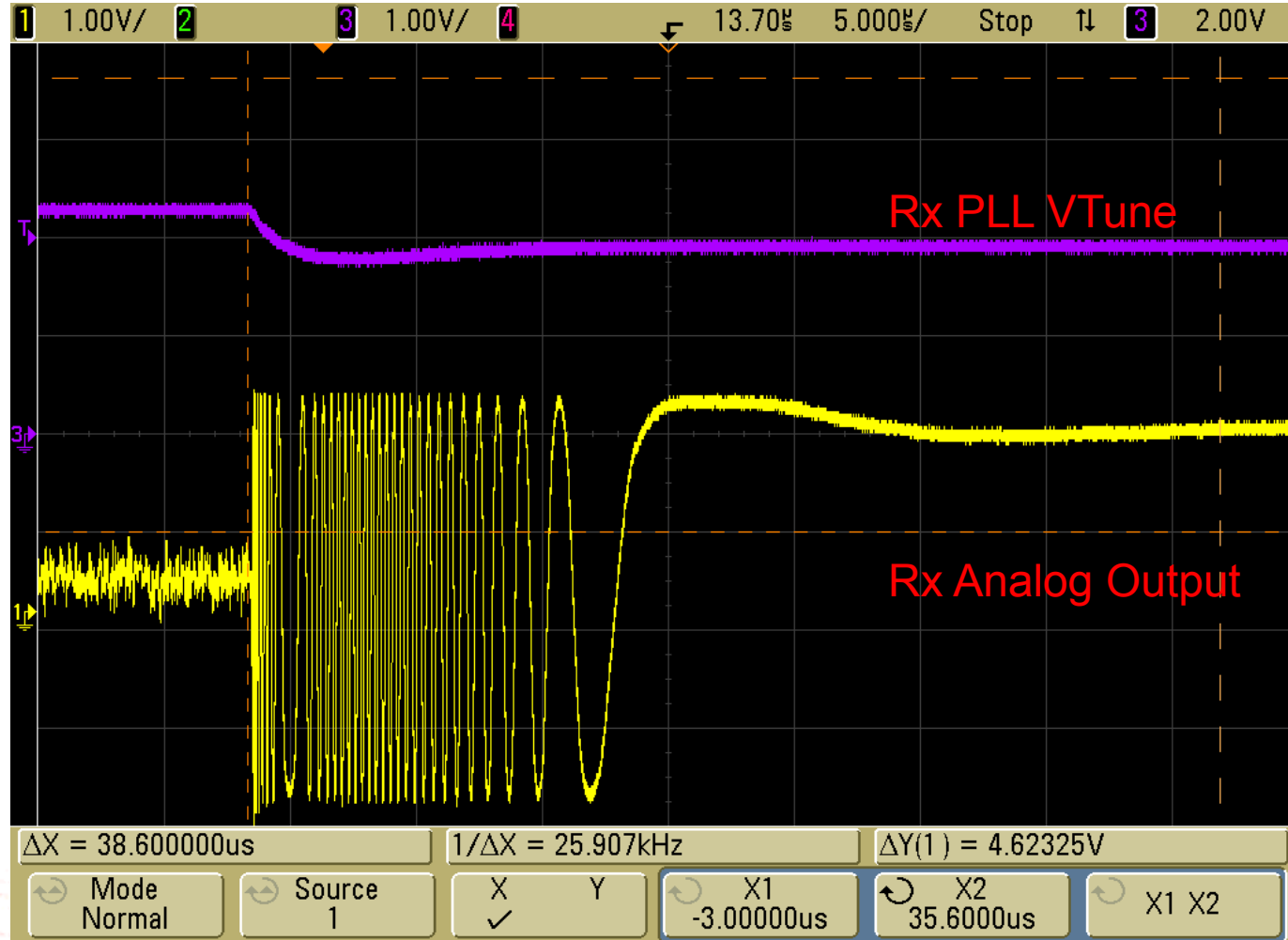
Measured Rx PLL Settling Time



Note:

When Rx PLL settles to 1950MHz after switching from Tx to Rx TDD mode we should expect DC at RX Analog Output.

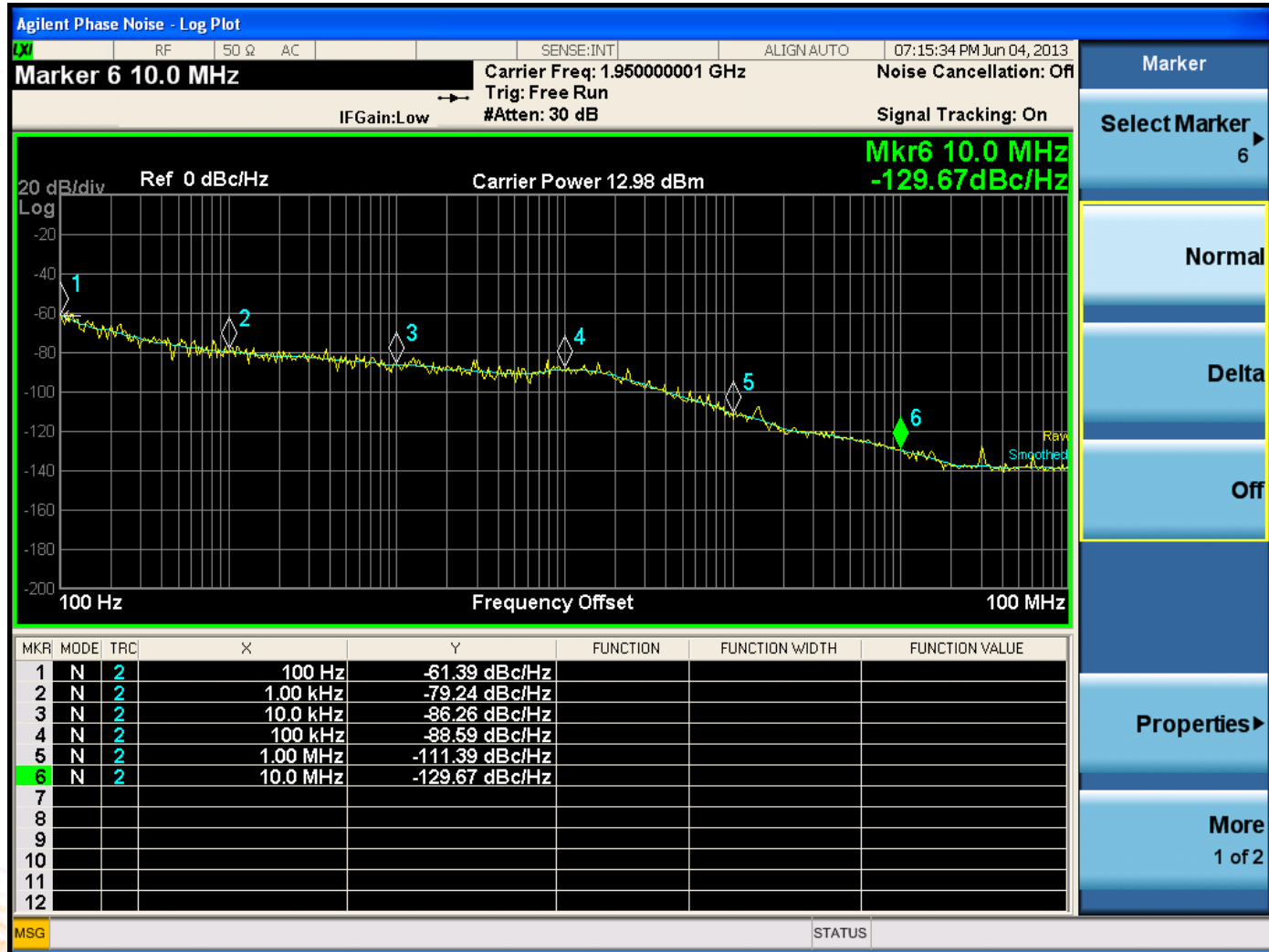
Measured Settling Time is **38.6us**.



200KHz Loop Filter Measurements

Charge Pump Current set to **1200uA**

Phase Noise with 200KHz Loop Filter



Integrated Phase Noise with 200KHz Loop Filter

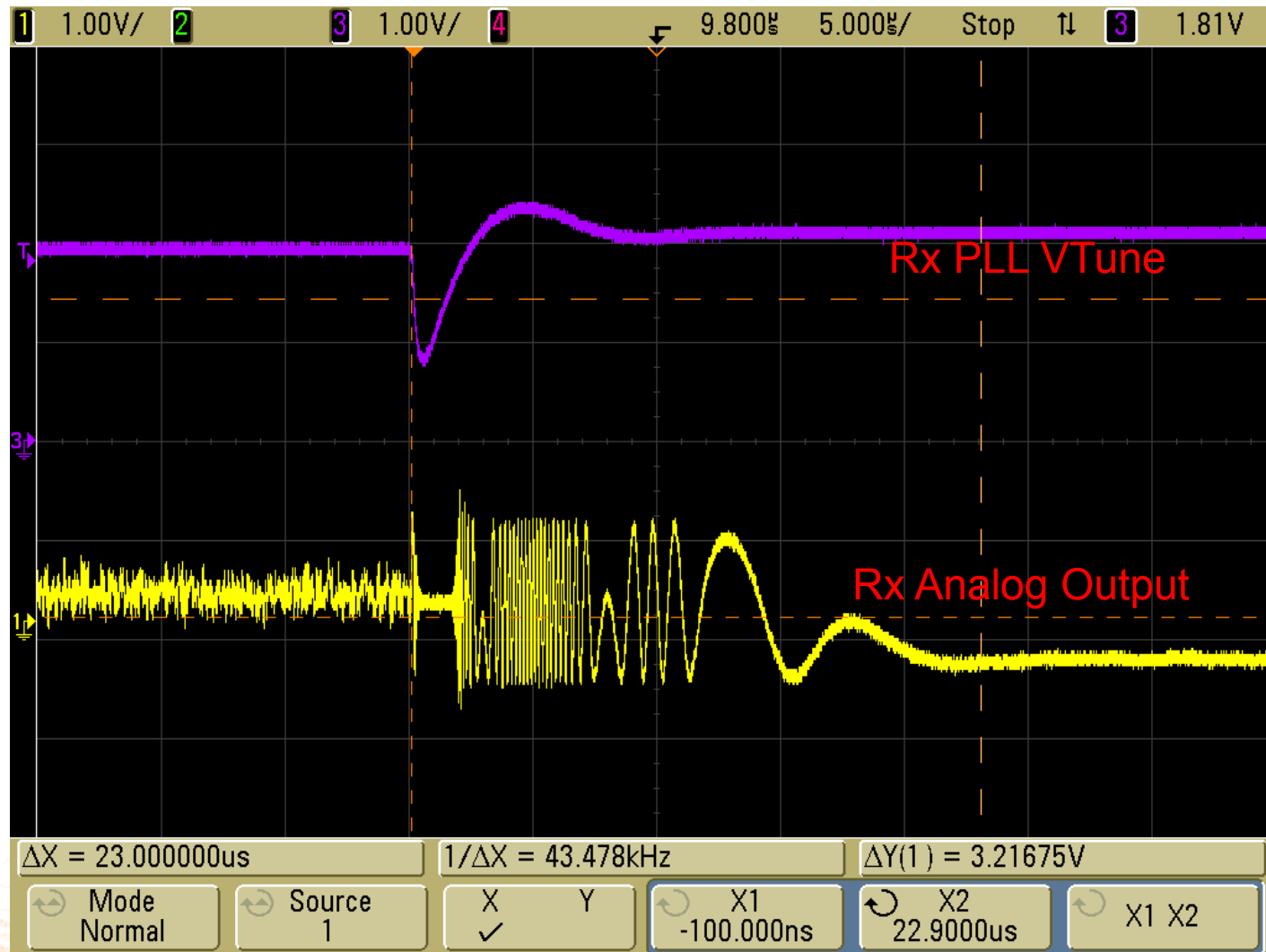


Integrated Phase Noise
– 1.308 Deg

Measured Rx PLL Settling Time

Note:
 When Rx PLL settles to 1950MHz after switching from Tx to Rx TDD mode we should expect DC at RX Analog Output.

Measured Settling Time is **23us**.



200KHz Loop Filter Measurements

Charge Pump Current set to **2400uA**

Phase Noise with 200KHz Loop Filter,



Integrated Phase Noise with 200KHz Loop Filter



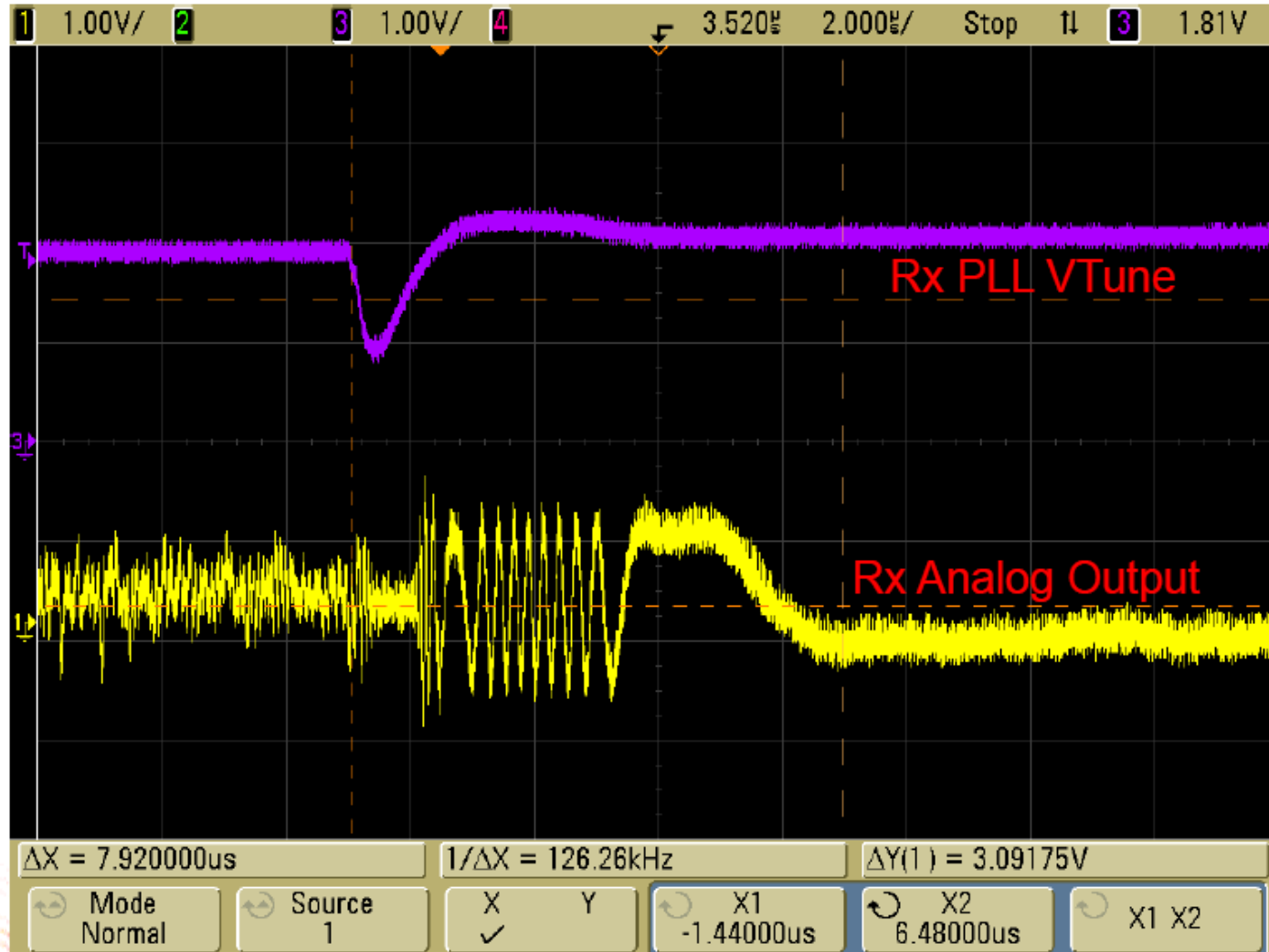
Integrated Phase Noise
– 1.348 Deg

Measured Rx PLL Settling Time

Note:

When Rx PLL settles to 1950MHz after switching from Tx to Rx TDD mode we should expect DC at RX Analog Output.

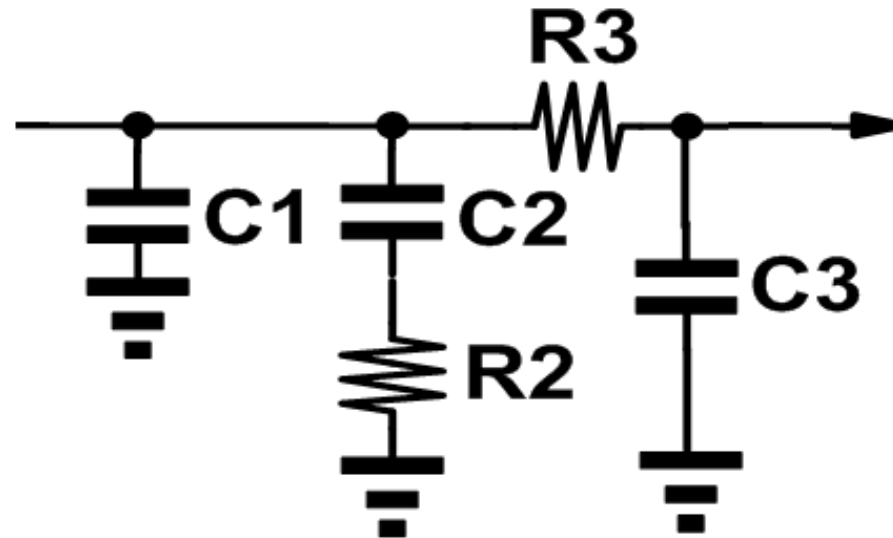
Measured Settling Time is **8us**.



Loop Filters

Filetr BW 100kHz :

C1 – 470pF
 C2 – 8.2nF
 R2 – 820Ohm
 R3 – 1.2kOhm
 C3 – 150pF



Filetr BW 200kHz :

C1 – 47pF
 C2 – 1.2nF
 R2 – 1.5kOhm
 R3 – 2.2kOhm
 C3 – 22pF