

Frequency planning part 1

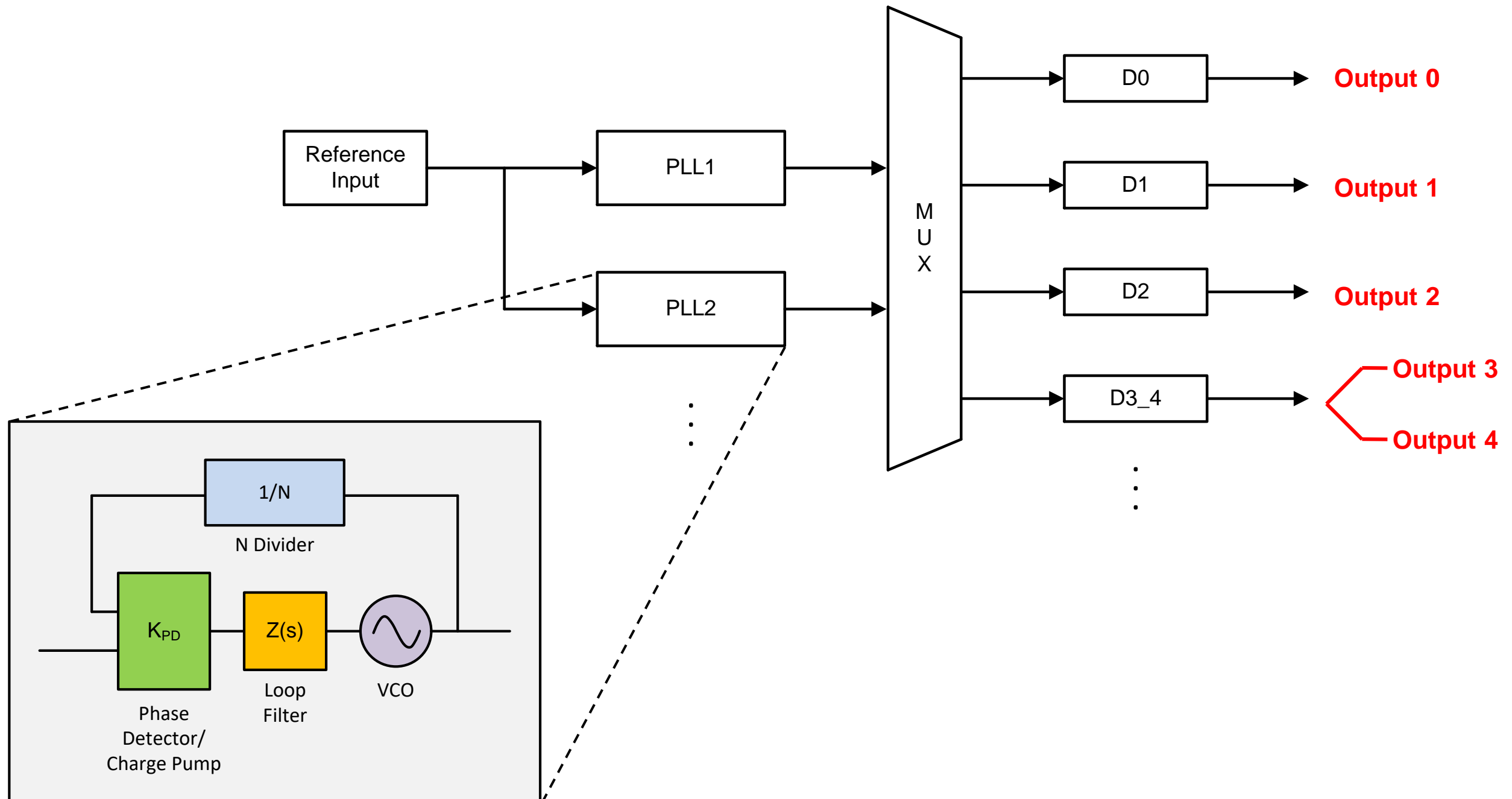
TI Precision Labs – Clock and timing system design considerations

Presented by Rob Rodrigues

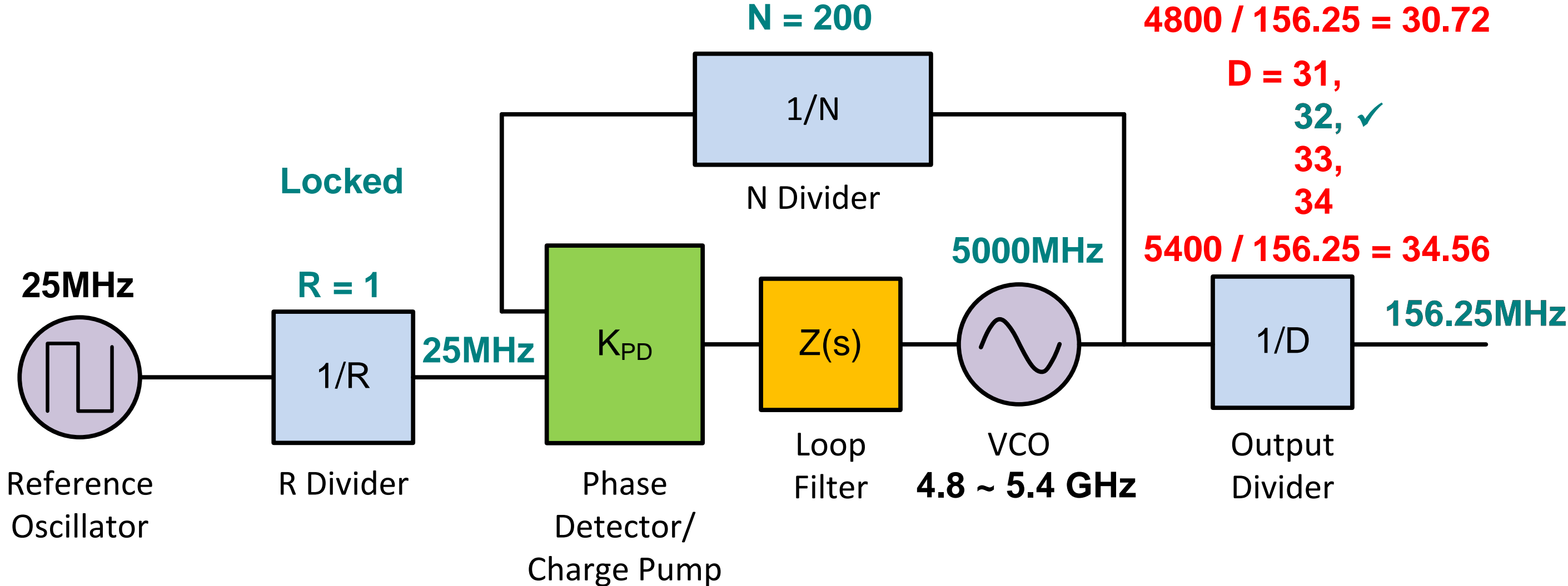
Prepared by Hao Zheng



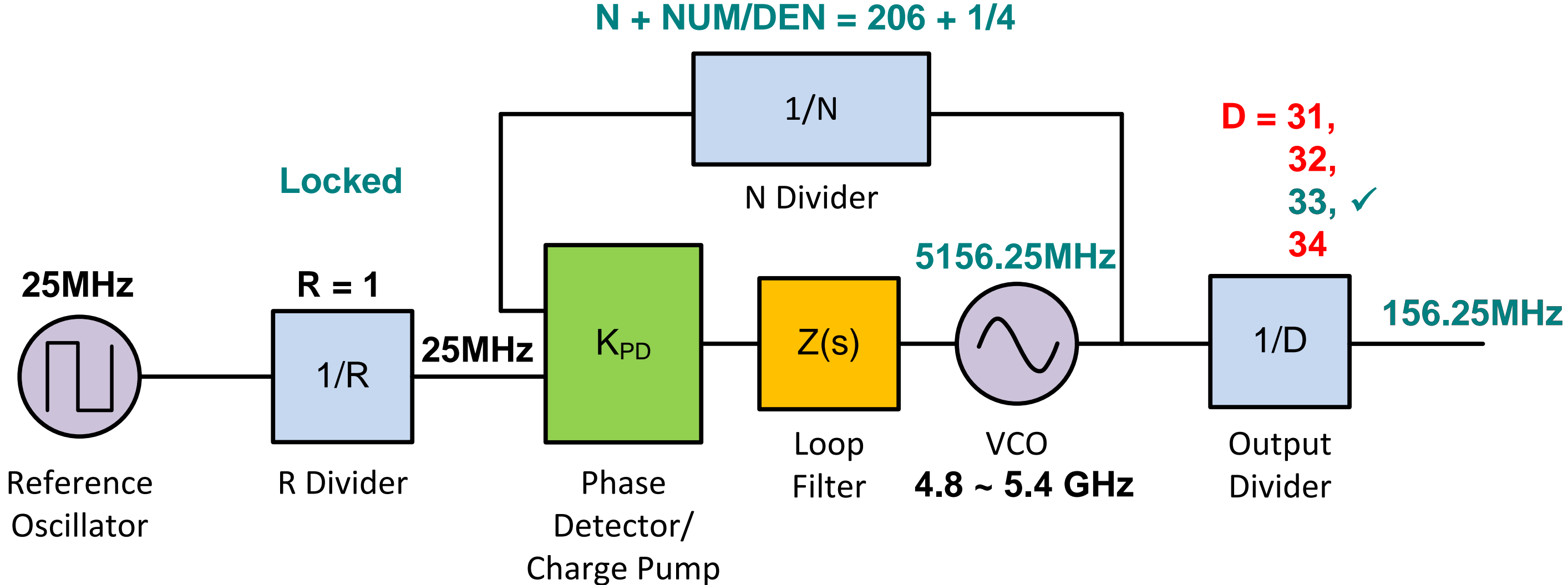
Clock generator overview



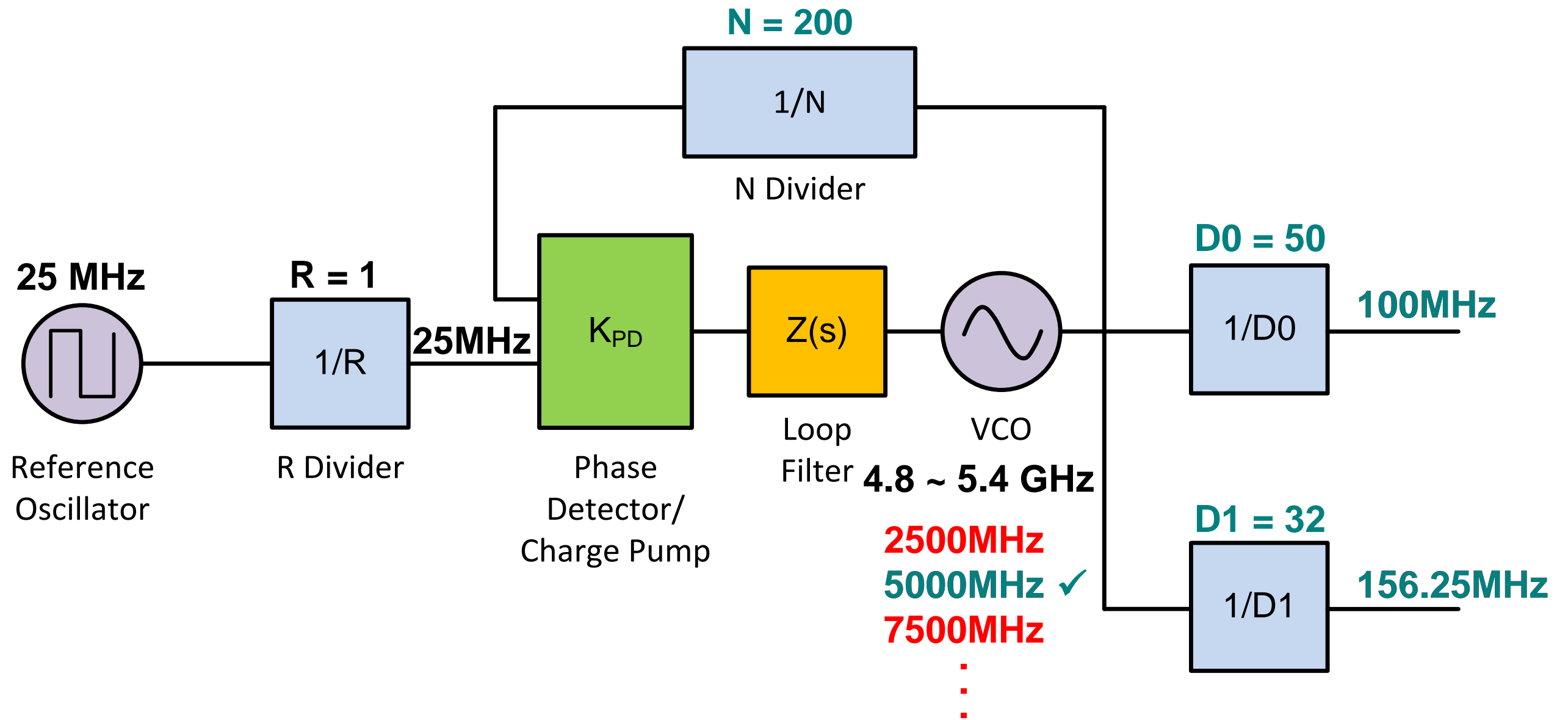
Frequency calculation



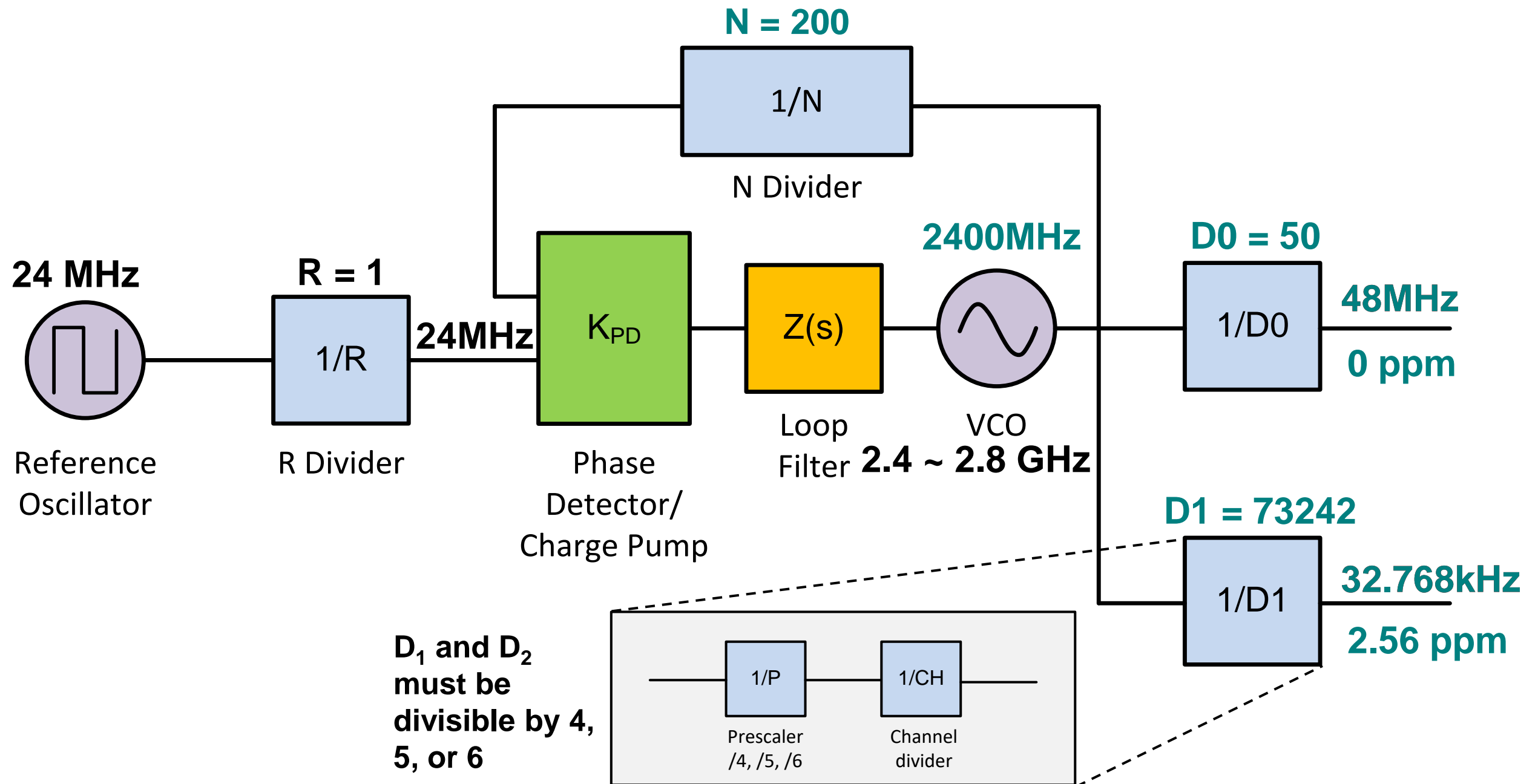
Frequency calculation (cont.)



One PLL, two output frequencies



One PLL, two output frequencies (cont.)



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Short Quiz

1. True or False:

The relationship between f_{VCO} (VCO frequency), D (output divider value) and f_{out} (output frequency) is $f_{\text{out}} = f_{\text{VCO}} * D$

Short Quiz

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Short Quiz

2. Choose one:

The relationship between f_{PD} (phase detector frequency), N (N divider value), NUM (numerator of fractional divider), DEN (denominator of fractional divider) and f_{VCO} for fractional PLL is

(a) $f_{VCO} = f_{PD} * (N - NUM/DEN)$ (b) $f_{VCO} = f_{PD} * (N + NUM/DEN)$ (c) $f_{VCO} = f_{PD} / (1/N + NUM/DEN)$

Short Quiz

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Short Quiz

3. True or False:

There is only one combination of reference input frequency, phase detector frequency and divider values that can generate the desired output frequency f_{out} ,

Short Quiz

3. True or False:

There is only one combination of reference input frequency, phase detector frequency and divider values that can generate the desired output frequency f_{out} ,

Short Quiz

4. Choose all that apply:

Which constraints determine the relationship between f_{VCO} , f_{out1} (frequency of output 1), f_{out2} (frequency of output 2) f_{VCO_min} and f_{VCO_max} for generating 0ppm outputs?

- a) f_{VCO} is common multiple of f_{out1} and f_{out2}
- b) $f_{VCO}/N = \text{integer}$
- c) $f_{VCO_min} < f_{VCO} < f_{VCO_max}$

Short Quiz

4. Choose all that apply:

Which constraints determine the relationship between f_{VCO} , f_{out1} (frequency of output 1), f_{out2} (frequency of output 2) f_{VCO_min} and f_{VCO_max} for generating 0ppm outputs?

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- c) $f_{VCO_min} < f_{VCO} < f_{VCO_max}$



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