ANALOG DEVICES

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ADF5356 Datasheet Update

Background

- Following a review of datasheet parameters, and to bring enhanced clarity to the operational performance of the part, some specifications have be updated and the production test accordingly enhanced
- The max input frequency for 4/5 prescaler is reduced to 5.7GHz and 6GHz (see next slide for details).
- **NB➔ ADF5356 has not been altered (no changes to part fabrication, assembly). In most cases, customers can continue to use the part with same performance.**

Specification Change: RF Output Frequency

- New RF Output Characteristics are based on updated characterization and yield results
- Specifications have been clarified compared to previous datasheet revision
- Updated:

RF OUTPUT CHARACTERISTICS					
VCO Frequency Range		3400	6800	MHz	Fundamental VCO range
$RF_{OUT}B$ Output Frequency		6800	13600	MHz	2× VCO output ($RF_{OUT}B$), prescaler = 8/9
		6800	13600	MHz	2× VCO output ($RF_{OUT}B$), prescaler = 4/5, Divided Feedback to N counter with Output Divider ≥ 2
		6800	12000	MHz	2× VCO output ($RF_{OUT}B$), prescaler = 4/5, Fundamental Feedback to N counter, T_A ≥ 25°C
		6800	11400	MHz	2× VCO output ($RF_{OUT}B$), prescaler = 4/5, Fundamental Feedback to N counter
$RF_{OUT}A+/RF_{OUT}A-$ Output Frequency		53.125	6800	MHz	Prescaler = 8/9
		53.125	6000	MHz	Prescaler = 4/5, T_A ≥ 25°C
		53.125	5700	MHz	Prescaler = 4/5

- Previously:

RF OUTPUT CHARACTERISTICS					
VCO Frequency Range		3400	6800	MHz	Fundamental VCO range
$RF_{OUT}B$ Output Frequency		6800	13600	MHz	2× VCO output ($RF_{OUT}B$), prescaler = 8/9
		6800	12000	MHz	2× VCO output ($RF_{OUT}B$), prescaler = 4/5
$RF_{OUT}A+/RF_{OUT}A-$ Output Frequency		53.125	6800	MHz	Prescaler = 8/9
		53.125	6000	MHz	Prescaler = 4/5

Prescaler Setting Explained

- A note has been added to explain how to set Prescaler Value

Updated:

Prescaler Value

The dual modulus prescaler (P/P + 1), together with the INT, FRACx, and MODx counters, determines the overall division ratio from the VCO output to the PFD input. The PR1 bit (Bit DB20) in Register 0 sets the prescaler value.

Operating at CML levels, the prescaler takes the clock from the VCO output and divides it down for the counters. It is based on a synchronous 4/5 core. When the prescaler is set to 4/5, the maximum RF frequency allowed is 6.0 GHz when $T_A \geq 25$ and 5.7 GHz for all temperature range. Therefore, when generating output frequencies above 6.0 GHz from RF output A, the prescaler must be set to 8/9. It is still possible to generate frequencies up to 13.6 GHz from RF output B with prescaler 4/5 by setting the Feedback Select bit (DB24) in Register 6 to Divided and setting the output divider greater than 2. The prescaler limits the INT value; therefore, if P is 4/5, N_{MIN} is 23, and if P is 8/9, N_{MIN} is 75.

Previously:

Prescaler Value

The dual modulus prescaler (P/P + 1), together with the INT, FRACx, and MODx counters, determines the overall division ratio from the VCO output to the PFD input. The PR1 bit (Bit DB20) in Register 0 sets the prescaler value.

Operating at CML levels, the prescaler takes the clock from the VCO output and divides it down for the counters. It is based on a synchronous 4/5 core. When the prescaler is set to 4/5, the maximum RF frequency allowed is 6.0 GHz. Therefore, when operating the ADF5356 above 6.0 GHz, the prescaler must be set to 8/9. The prescaler limits the INT value; therefore, if P is 4/5, N_{MIN} is 23, and if P is 8/9, N_{MIN} is 75.