Synthesizer Comparison: Analog Devices ADF4355-2 to Maxim MAX2871

Applications: 1) LO's for Spectrum Analyzer a) 3805-3825 MHz b) 360 MHz
2) Signal Generator- Low Cost, General Purpose

SPECIFICATION	ADF4355-2			MAX2871			NOTES
Frequency Range[MHz]	54-4400			23.5-6000			Advantage: Maxim
Power Out(s)	~ 3dBm			-4 to +5dBm			Advantage: Maxim
Reference Freq[MHz]	10-250			10-210			No Significance
Resolution (With 40MHz Fpdf as an example)	<<1Hz			Depends on Fpdf.With ~10KHz resolution.			Advantage: Analog Devices See Conclusions.
Phase Detector Freq[MHz]	125 MHz max			125 MHz typ			No Significance
DC Power	+5V @78mA +3.3V@116mA= 773mW			+3.3V @ 200mA=660mW			Advantage: Maxim
Phase Noise (Open-Loop)		@10K Offset	@100K Offset		@10K Offset	@100K Offset	Advantage: Analog Devices. But this spec not as important since part is used in closed-loop mode.
	3.4GHz	-92	-115	3 GHz	-83	-111	
	5GHz	-79	-112	4.5GHz	-77	-106	
	6.8GHz	-78	-110	6GHz	-71	-101	
Phase Noise (Closed-Loop, example)		@10K Offset	@100K Offset		@10K Offset	@100K Offset	No Net Advantage. 10K noise lower on Maxim, but 100K noise lower on Analog. Loop filter has much effect on these parameters in closed-loop mode.
	3.4GHz	-92	-113	3 GHz	-102	-105	
	5GHz	-90	-111	4.5GHz	-95	-101	
	6.8GHz	-90	-108	6GHz	-92	-98	
Mux Output Signals	7 Output Signals			9 Output Signals			Slight Advantage to Maxim
Programming	(13) 32-Bit Multi-Function Registers			(7) 32-Bit Multi-Function Registers			Maxim somewhat easier, but still investigating.
AutoCal or Equiv.	AutoCal			Auto Selection			No significant difference
Software Dev Package	ADF4355.exe (Windows only)			MAX287X.exe Works on Linux w/ Wine!			Advantage: Maxim
Package	32 pin LFCSP 5x5mm			32 pin TQFN 5x5mm			same
Pricing:	$33.16@QTY=1 Digikey $30.93@QTY=1 Mouser			$11.53@QTY=1 Digikey $11.64@QTY=1 Mouser			Advantage: Maxim

(Conclusions on next page)

Conclusions:

The Analog Devices ADF4355-2 is somewhat more sophisticated device than the MAX2871, in that it has a Fractional-N Dual Modulus Dividers capable of very fine <<1 Hz resolution (step size) with relatively high Fpdf . That is because in addition to the FRAC1 divider there is an additional FRAC2 divider capable of even finer step size. This in addition to its low phase noise multiple section VCO probably accounts for its higher price. The very fine steps can be attained at its maximum frequency of 4400MHz and still achieve fast lock times and very high reference spur rejection.
It is probably most optimal for the Signal Generator that needs to combine fast lock times, relatively low spurs, and almost infinite resolution.

That said--- If a signal source is needed that utilizes some judicious "trade-off", the MAX2871 will allow moderate resolution for example ~10KHz steps with a 40MHz Fpdf. To attain finer steps, the Fpdf is reduced by using the MAX2871's R Divider-which allows the reference frequency to divided down to provide a Fpdf low enough for ~2500 Hz steps at 4000 MHz, as long as the loop filter is designed to reject reference spurs.
So, for the PROJECT #1, LO#2 (~3815MHz+/- 10MHz) and LO#3 (~380MHz+/-2MHz) are not required to have any step sized less than 2.5KHz. **So the MAX2871's can replace the ADF4355-2's in PROJECT#1 at LO#2 and LO#3.**

As to **PROJECT#3 (Signal Generator), the MAX2871 still can be used**, as long as excessively fine step sizes are not needed at microwave (Fout>1000MHz). As far as RF Frequencies (<1000MHz) the MAX2871 will be able to provide finer step sizes die to the use of the output dividers. Other methods can be used with the MAX2871 to provide super-fine step sizes, with fast locking and low spurious, but they make for a more complexity.