Parameter	Min.	Typ.	Max.	Unit	Condition/Comment
Output Frequency Range	30		3800	MHz	
Reference Amplitude	0.2	0.8	2.7	Vpp	At PVDD>2.7V
Reference Frequency	10		52	MHz	For continuous LO frequency range
Frequency Resolution			24.8	Hz	Using 52 MHz PLL reference clock
850 MHz Phase Noise 1 kHz offset 5 kHz offset 10 kHz offset 100 kHz offset 1 MHz offset 30 MHz offset		-96 -97 -99 -107 -131 -158		dBc/Hz	
2.0 GHz Phase Noise 1 kHz offset 5 kHz offset 10 kHz offset 100 kHz offset 1 MHz offset 30 MHz offset		-91 -92 -92 -102 -127 -158		dBc/Hz	
2.7 GHz Phase Noise 1 kHz offset 5 kHz offset 10 kHz offset 100 kHz offset 1 MHz offset 30 MHz offset		-87 -88 -92 -98 -123 -158		dBc/Hz	
3.5 GHz Phase Noise 1 kHz offset 5 kHz offset 10 kHz offset 100 kHz offset 1 MHz offset 30 MHz offset		-74 -80 -83 -85 -120 -152		dBc/Hz	
Reference Spurious Outputs		-70	-68	dBc	
Other Spurious Outputs		-60	-55	dBc	
850 MHz IQ Phase Error		0.8	1	degrees	
2000 MHz IQ Phase Error		2		degrees	After calibration
3500 MHz IQ Phase Error		3		degrees	
IQ Amplitude Error		+/- 0.1	+/- 0.2	dB	
PLL settling time		50	150	µs	loop BW=70 kHz

Table 5: Synthesizer specifications

RF PORTS

LMS7002M has two transmitter outputs and three receiver inputs for each of the dual transceivers.

The optimum transmitter output load is 40Ω differential at the output pads. The final stage amplifiers are open drain and require +1.8V voltage supply.

The receiver inputs are common-source with different inductive degeneration, optimized for different frequency bands. They need to be externally matched for optimized narrowband performance or broadband utilizing a wideband transformer.

TX and RX LOW PASS FILTERS

LMS7002M integrates selective low pass filters in both the TX and RX paths. Filters have programmable pass band in order to provide more flexibility on the DAC/ADC clock frequency and also to provide adjacent channel rejection in the receive chain. The complete filtering function is a combination of analog filtering and digital TSP filtering. Analog filters are tunable from 0.7 MHz to 108 MHz. Figures 6, 7, 8, 9 10 and 11 illustrate the analog tunable filter bandwidths. The digital filters provide a lower pass band of 0.7 MHz. Using such mixed mode filtering (digital and analog) provides 60 dB anti alias performance and 40 dB adjacent channel rejection as the worst case scenario. Obviously, the lower pass band and/or higher decimation will give better results. The TX filtering chain works in the same manner.
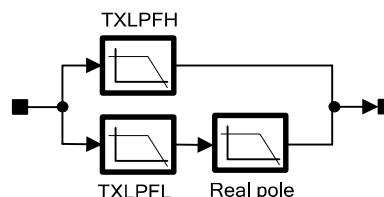

Figure 6: TX analog filtering chain