NXP LO generators TFF11xxxHN, TFF1003HN, TFF1006HN & TFF1007HN

Ultra-low-noise LO generators for microwave radios

Manufactured in NXP's breakthrough QUBiC4X SiGe:C process technology, these highly integrated, alignment-free LO generators are low power consumption and low-spurious solutions that simplify design-in and lower the total cost of ownership.

Features

- TFF11xxxHN family: Lowest noise LO generators for a full family in range 7 to 15 GHz
- Integrated VCO and divider PLL for Ku-band
  - TFF1003HN: 12.80 to 13.05 GHz VCO range
  - TFF1006HN: 9.375 GHz VCO range
  - TFF1007HN: 14.75 to 15.00 GHz VCO range
- Maximum power consumption for all types does not exceed 400 mW
- Phase-noise compliant with IESS-308 (Intelsat)
- Proven QUBiC4X SiGe:C technology (120-GHz fT process)
- External loop filter
- Differential input and output
- Lock-detect output
- Internally stabilized voltage reference for loop filter
- 24-pin HVQFN (SOT616-1) package

Applications: TFF11xxxxHN family

- Industrial/Medical Test and Measurement Equipment
- Electronic Warfare (EW)
- Electronic Countermeasures (ECM)
- Point to Point
- Point to Multi-Point
- Satellite Communication

Application: TFF1003HN, TFF1006HN and TFF1007HN

- VSAT

These ultra-low-noise local-oscillator (LO) generators, optimized for use in many different microwave applications between 7 and 15 GHz, deliver highly accurate performance in a small footprint. They require no alignment or frequency modification on the production line, so they simplify manufacturing. High integration saves board space and makes design-in easier, for lower overall cost and faster development, enabling quick time-to-market.

Since these ICs are manufactured in NXP's industry-leading QUBiC4X SiGe:C process, they offer better overall RF

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performance, are more robust than their GaAs equivalents, and consume much less power. The process technology also enables higher integration, for added features. NXP owns the industrial base for production (wafer fab, test, assembly), so volume supplies can be assured.

The TFF1003HN is the basis for the entire family of LO generators. It has VCO coverage of 12.8 to 13.05 GHz and accepts input signals from 50 to 816 MHz. The divider can be set for 16, 32, 64, 128, or 256, and the output level is -5 dBm with a stability of ±2 dB. The TFF1006HN is similar, but has a VCO of 9.375 GHz and support for input signals from 36 to 586 GHz. The family of LO generators is completed by a range of 18 different devices operating in a center frequency ranging from 7 to 15 GHz. The RF performance of all these devices is consistent with the TFF1003HN.

The TFF1007HN offers the highest performance. It has a VCO range of 14.75 to 15 GHz and supports input signals from 230.46 to 234.48 MHz. It offers improved in-band phase noise (PN) of -140 dBc/Hz and increased minimum output power (-4 dBm). The divider setting is 64 only. All the LO generators have very low power dissipation (not exceeding 400 mW), and all are available in a space-saving 24-pin HVQFN package.

Low noise LO generators for general microwave applications

Type	Package	$f_{IN(REF)}$	V_{CC}	I_{CC}	PLL phase noise @ N=64		PLL			Output buffer		Input
							$f_{o(RF)}$			P_o	$RL_{out(RF)}$	S_i
			Typ	Max	@ 100 kHz	@ 10 MHz	Min	Typ	Max	Typ	Max	Min
		MHz	V	mA	dBc/Hz	dBc/Hz	GHz	GHz	GHz	dBm	dB	dBm
TFF11070HN	SOT616	27 - 448	3.3	100	-95	-131	6.84	7.00	7.16	-5	-10	-10
TFF11073HN	SOT616	28 - 468	3.3	100	-95	-131	7.16	7.33	7.49	-5	-10	-10
TFF11077HN	SOT616	29 - 490	3.3	100	-95	-131	7.49	7.67	7.84	-5	-10	-10
TFF11080HN	SOT616	31 - 513	3.3	100	-95	-131	7.84	8.02	8.21	-5	-10	-10
TFF11084HN	SOT616	32 - 537	3.3	100	-95	-131	8.21	8.40	8.59	-5	-10	-10
TFF11088HN	SOT616	34 - 562	3.3	100	-95	-131	8.59	8.79	8.99	-5	-10	-10
TFF11092HN	SOT616	35 - 588	3.3	100	-95	-131	8.99	9.20	9.41	-5	-10	-10
TFF11096HN	SOT616	37 - 616	3.3	100	-95	-131	9.41	9.63	9.85	-5	-10	-10
TFF11101HN	SOT616	38 - 644	3.3	100	-95	-131	9.85	10.07	10.31	-5	-10	-10
TFF11105HN	SOT616	40 - 674	3.3	100	-95	-131	10.31	10.54	10.79	-5	-10	-10
TFF11110HN	SOT616	42 - 706	3.3	100	-95	-131	10.79	11.03	11.29	-5	-10	-10
TFF11115HN	SOT616	44 - 738	3.3	100	-95	-131	11.29	11.55	11.81	-5	-10	-10
TFF11121HN	SOT616	46 - 773	3.3	100	-95	-131	11.81	12.09	12.36	-5	-10	-10
TFF11126HN	SOT616	48 - 809	3.3	100	-95	-131	12.36	12.65	12.94	-5	-10	-10
TFF11132HN	SOT616	51 - 846	3.3	100	-95	-131	12.94	13.24	13.54	-5	-10	-10
TFF11139HN	SOT616	53 - 886	3.3	100	-95	-131	13.54	13.85	14.17	-5	-10	-10
TFF11145HN	SOT616	55 - 927	3.3	100	-95	-131	14.17	14.50	14.83	-5	-10	-10
TFF11152HN	SOT616	58 - 970	3.3	100	-95	-131	14.83	15.18	15.52	-5	-10	-10

VSAT ICs

Type	Package	$f_{IN(REF)}$	V_{CC}	I_{CC}	PLL phase noise @ N=64			PLL	Output buffer		Input
								$f_{o(RF)}$	P_o	$RL_{out(RF)}$	S_i
			Typ	Max	@ 1 kHz	@ 100 kHz	@ 10 MHz		Typ	Max	Min
		MHz	V	mA	dBc/Hz	dBc/Hz	dBc/Hz	(GHz)	dBm	dB	dBm
TFF1003HN	SOT616	50~815	3.3	130	-94	-100	-130	12.8~13.05	-5	-10	-10
TFF1006HN	SOT616	36~586	3.3	130	-94	-100	-130	9.375	-5	-10	-10
TFF1007HN	SOT616	230.46~234.38	3.3	130	-104	-104	-130	14.75~15	-3	-10	-10

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