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Review Paper on the Noise Cancellation Techniques in High Frequency Amplifier for Wireless Application

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ABSTRACT
Low Noise Amplifier is the Front End Block of Radio-Frequency Receiver System. It is Key Component for a range of applications such as Satellite Communication, Radar Transmitter, and Wireless Communication System etc. Losses, S- Parameter and Power Dissipation are required in its designing. In this research, have surveyed almost all work of past decade, here, will Study about Varying Range of Noise Figure, Gain, Power Consumption, S-Parameter and Different Methodologies Used in Different Research Papers from 1998 to 2016.

I. INTRODUCTION

Low noise amplifier versatile needed in Wi-Max, WLAN, Bluetooth, GSM application. Gain-boosting technique by inductive common-base termination. An analysis of this technique, the stability limit and an optimization methodology while maintaining stable operation is provided within this work. The results demonstrate state-of-the-art performance; exceeding advancements in IC technologies have enabled realization of micro-systems for a variety of applications in the millimetre-wave bands. Especially, the availability of high-performance,

II. REVIEW OF TECHNIQUES

1. Yo-Sheng [1] ,In this paper presented low noise-figure (NF) and high power gain 3 -10 GHz ultra-wideband low-noise amplifier used to achieve wideband input impedance matching , pole frequency and pole quality factor of the second-order NF flat condition. Furthermore, the LNA achieves minimum noise figure in the frequency range of 3 10 GHz, one of the best noise figure results ever reported for a 3 10 GHz CMOS low noise amplifier.
2. Jeong-Yeol Bae, [2] – In this paper author discussed about linear differential low-noise electronic amplifier for digital TV applications. The designed LNA is the modification of the work done by Bruccoleri et al. in 2004. So as to extend the one-dimensionality of Bruccoleri et al.'s LNA, the Volterra series was adopted for designing of the noise-cancelling circuit. The author has presented a new method to increase the linearity in wideband LNAs. Bruccoleri's wideband noise-cancelling LNA is analyzed to identify the source of poor linearity using Volterra series. From the analysis, a modified low-noise high-linearity wideband, adding a decoupling capacitor, is proposed and achieved high immune to the offset frequency of two-tone signals.
3. Hong-Yeh Chang, [3] – In this paper author presented that design and analysis of two-stage coupled construction voltage controlled generator (QVCO).
   By discrimination the planned dual-gate device, the parasitic capacitance and also the effective substrate resistance are often reduced. Moreover, the 3-dB cutoff frequencies are often extended attributable to the reduction of the Miller result. The information measure of the twin gate LNA is investigated to match with the traditional cascade configuration and generation discrimination.
4. Han-Chih Yeh, [4] – In this paper, author presented the look and analysis of a CMOS variable gain amplifier (VGA) with the inherent linearizers and noise reduction technique is conferred. A band low power and miniature VGA intended and fancied to maximize the gain management and to enhance the dimensionality of NMOS junction transistor is inter calary within the cascade structure as an inherent linearizer. similar gain management vary; the planned VGA has comparable NF performance with the 65-nmCMOSVGAs that are according.
5. Xiaohua Yu, [5] – Author presented a reconfigurable multimode low-noise electronic equipment (LNA) capable of single-band, simultaneous dual-band, and ultra-wideband operation. The multimode operation is complete by incorporating a switched multi faucet electrical device into the input matching network of associate inductively

degenerated common supply electronic equipment.

6. Han-Chih Yeh, [6] - Author presented in this paper, the planning and analysis of CMOS low-noise amplifiers (LNAs) with a magnetic coupled technique in several cascade topologies. To attenuate the noise figure (NF) and also the offer voltage, and to ensure giant 3-dB information measure, transformers are designed and placed between the transistors. low offer voltage and broadband LNAs are designed, fabricated, and tested for demonstration. The primary LNA uses the magnetic coupled cascade configuration. The second LNA is consisted of magnetic coupled cascade configuration with 2 amplification stages. The third one-stage LNA is predicated on the magnetic coupled triple cascade configuration. Compared with the traditional cascade LNAs, the planned magnetic coupled cascade LNAs have higher NF, During this paper, the magnetic coupled low-tension multi cascade topology has been given, analyzed, and applied to implement 3 low-tension cascade CMOS LNAs. 2with magnetic coupled cascade and triple-cascade configurations were designed at -band.

7. Ming-Hsien Tsai, [7] – Author states that the electricity discharge (ESD)/matching co-design methodology, a band low-noise electronic equipment employing a grounded spiral electrical device in conjunction with a mum capacitance for ESD protection and band matching is incontestable in an exceedingly sixty five nm CMOS. The shunt electrical device provides a good two-way ESD protection to the bottom and therefore the series capacitance greatly enhances the breakdown level within the current discharge path.

8. Han-Chih Yeh, [8] - In this paper, author analyzed CMOS multi-cascade configuration with a noise reduction transformer topology are best to ,miniature, and band low-noise amplifiers (LNAs) were designed and fancied for demonstration. One with a transformer triple-cascade configuration was designed at U-band, and therefore with a transformer quadruple-cascade configuration was designed at V-band. whereas the transformer quadruple-cascade LNA options even higher gain performance.

9. Hsien-Ku Chen, [9] - Here Author presents a wideband amplifier (LNA) supported by cascade configuration with resistive feedback. Wideband input-impedance matching was achieved employing a shunt–shunt feedback resistance in conjunction with a preceding -match network, whereas the wideband gain response was obtained employing a post-cascade inductance , that was inserted between the output of the cascading semiconductor device and also the input of the shunt–shunt resistive feedback network to reinforce the gain and suppress noise. Furthermore, comparisons with the CMOS-based wideband LNAs for 3–10-GHz applications in the literature show that the wideband LNA presented here exhibits one of the best NF flatness and the smallest chip size. The results indicate that the proposed LNA topology is very suitable for low-cost and high-performance wideband LNAs.

10. Mingqi Chen, [10] – A completely unique self-biased resistive- feedback topology is designed. Two inductances with shunt-peaking inductor square measure exploited to increase the information measures. A PMOSFET with inductive degeneration is chosen to spice up the gain whereas maintaining low noise figure (NF) at high frequencies.

11. Xiaohua Fan,[11] - In this paper author presented common supply cascade low-noise amplifier (CS-LNA) are design as a CS-CG two stage amplifier is presented in this paper, during this work, an amplifier connected at the gate of the cascade semiconductor and electrical phenomenon cross-coupling square measure strategically combined to scale back the noise and also the nonlinearity influences of the cascade transistors during a differential cascade CS-LNA. It uses a smaller noise reduction electrical device compared with the standard electrical device primarily based technique.

12. Yueh-Hu Yu, [12]- Author in this paper presented the planning of a low-power ultra-wideband. Common-source amplifier is cascaded to the distributed amplifier to boost the gain at high frequency and extend the information measure. The inductive disintegration method was applied to the distributed amplifier design to enhance the noise characteristic and compensate the gain roll-off at high frequency and extend the information measure.

13. Antonio Liscidini, [13] –Here author presents a totally integrated CMOS receiver front-end supported an immediate conversion design for UMTS/802 11b-g and a low-IF design at a100 kHz for DCS1800. The two key building blocks are multiband low-noise electronic equipment (LNA) that uses feedback to enhance its gain and an extremely linear mixer. ACMOS multi standard front-end receiver based on a positive feedback multiband LNA and a high-linearity

mixer has been presented. A new topology narrowband tunable LNA allows to use a common input for all the standards considered,

Table 2.1 –Survey Table of Previous Research Works in form of S11

Year	Title	Topology	Freq.	S11 (dB)	NF (dB)	Pdc (mW)
2014 IEEE	High-Performance Wideband Low-Noise Amplifier Network	Enhanced -Match Input Network	3 -10 GHz	<-10	2.3	18
2013 IEEE	A Compact 2.1–39 GHz Self-Biased Low Noise Amplifier	Inductive series peaking	2.1-39 GHz	<-8	4.5	25.5 mW

Ref	Year	Journal & Author	Technology	Bandwidth (GHz)	NF (dB)	Power consumption
[1]	2014	IEEE	Enhanced -Match Input Network	3 -10 GHz	2.3	18
[2]	2013	IEEE Xiauhua Yu	0.13 µm CMOS	4.3 -10.8	4-5.3	6.4 mW
[3]	2013	IEEE chin wei kuo	0.18 µm CMOS	17-35.2	-	711mW
[4]	2013	IEEE Boyu HU	0.18 µm CMOS	2.5-11.7	6.3-6.6	8
[5]	2012	IEEE Shou-Hsien Weng	HBT-HEMT	1.8-26	7.4	-
[6]	2012	IEEE Sven Karsten Hample	Rx and TX frontend	9	6	54mW

Table 2.2 –Survey Table of Previous Research Works

Here, some of the previous work in LNA is surveyed and tabularized in table 2.1. Different topologies used in LNA are discussed here with a varying noise figure of 1.6-5.9dB, Power dissipation varying between 5.8-25.5mW and S-Parameter ranging between <-6 to <-10 dB.

III. CONCLUSION

In this paper surveyed almost all work of past decade, Studied about Varying Range of Noise Figure, Gain, Power Consumption, S-Parameter and Different Methodologies Used in Different Research Papers from 1998 to 2016.Here, previous work done in low noise amplifier (LNA) are discussed and reviewed, in this discussed about the different approaches, the used of previous methodology, problem identification, disadvantages of methodology, and the objective. Different topologies used in LNA are discussed here with a varying noise figure of 1.6-5.9dB, Power dissipation varying between 5.8-25.5mW and S-Parameter ranging between <-6 to <-10 dB, The low-noise amplifier may be a special form of electronic amplifier accustomed amplifier weak signals captured by an antenna . it is essential for an LNA to spice up the specified signal power whereas adding as very little noise and distortion as doable in order that the retrieval of this signal is feasible within the later stages within the system. Wireless applications are almost by definition battery power-driven devices. Power consumption is so a serious concern for the LNA. the main target of the task is to search out an LNA design which provides ultra-low power consumption.

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