Pomerač faze reflektivnog tipa

[13M071MMT] - Milimetarski talasi

student Aleksandar Vuković

Univerzitet u Beogradu
Elektrotehnički fakultet

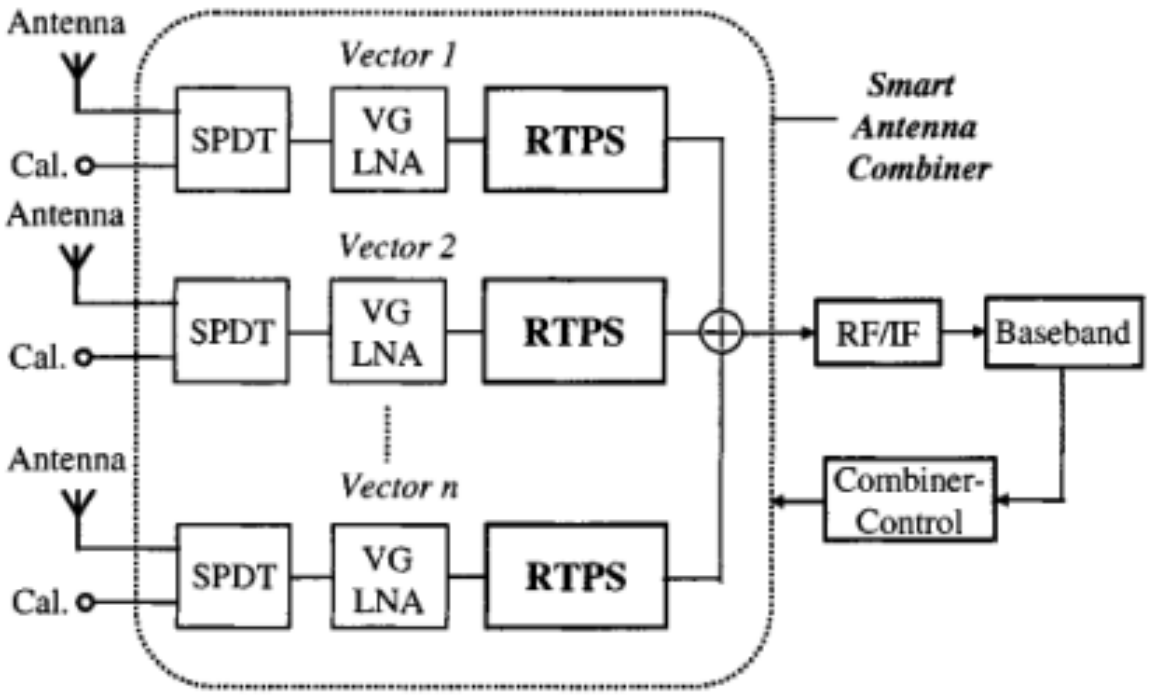
22. 7. 2019.

Uvod

Sadržaj prezentacije

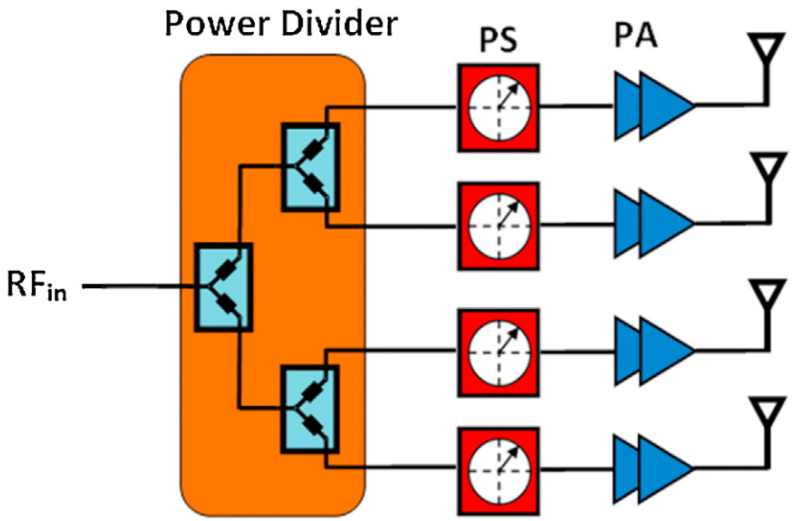
- Pomerač faze reflektivnog tipa sa 360^o opsegom za *smart* antenske sisteme za C-opseg u 0.6 μm GaAs MESFET tehnologiji (2002)
- 16-elementni fazirani niz kao prijemnik za opseg oko 60 GHz u IBM 0.12 μm SiGe BiCMOS tehnologiji (2011)
- Pomerač faze reflektivnog tipa sa konstantnim gubicima za oko 24 GHz u 0.18 μm CMOS tehnologiji (2015)

Prijemnik


Antenna
Cal.
Antenna
Cal.
Antenna
Cal.
Vector 1
Vector 2
Vector n
SPDT
SPDT
SPDT
VG
LNA
VG
LNA
VG
LNA
RTPS
RTPS
RTPS
Smart
Antenna
Combiner
RF/IF
Baseband
Combiner-
Control

učestanost	24 GHz
opseg faznog pomeraja	185^o
maksimalni gubici	10.7 dB
varijacija gubitaka	0
S11	$<$ 15 dB
potrošnja	0
površina na čipu	0.7 mm^2

Beamforming predajnik

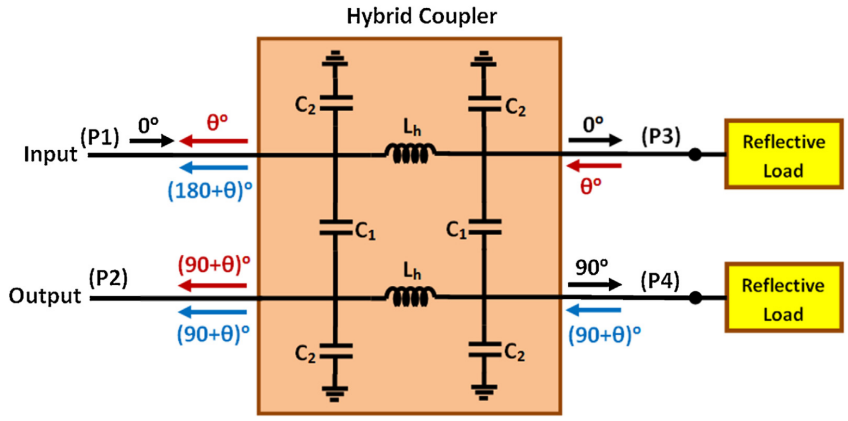


Specifikacije:

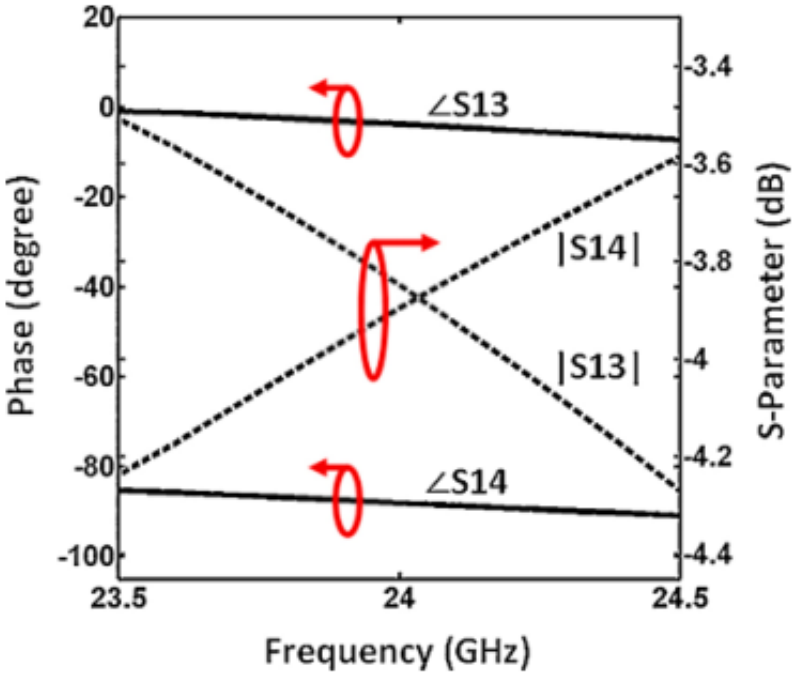
- varijacija slabljenja u odnosu na fazni pomeraj
- potrošnja

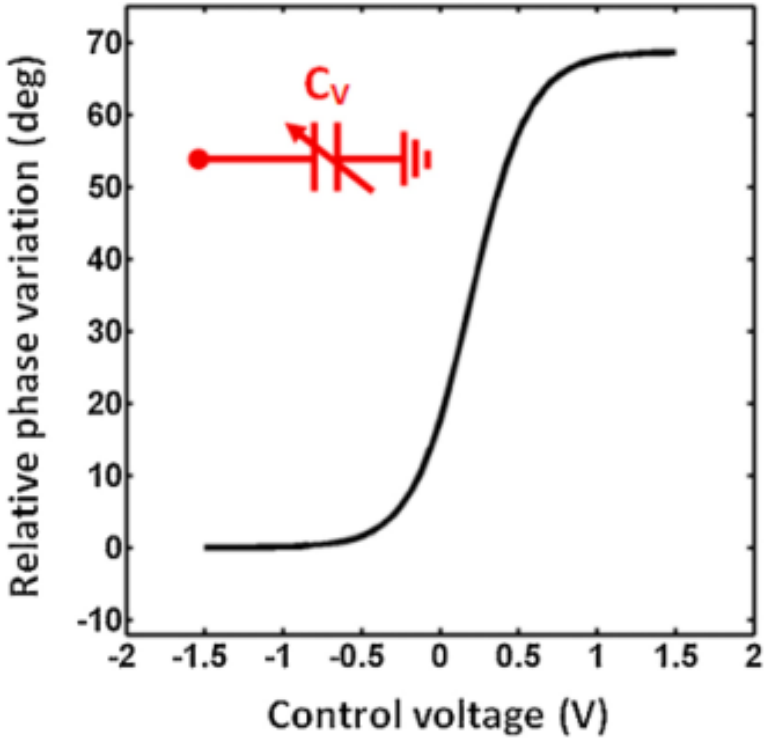
Hibridni sprežnjak

some text here some text here
some text here some text here
some text here

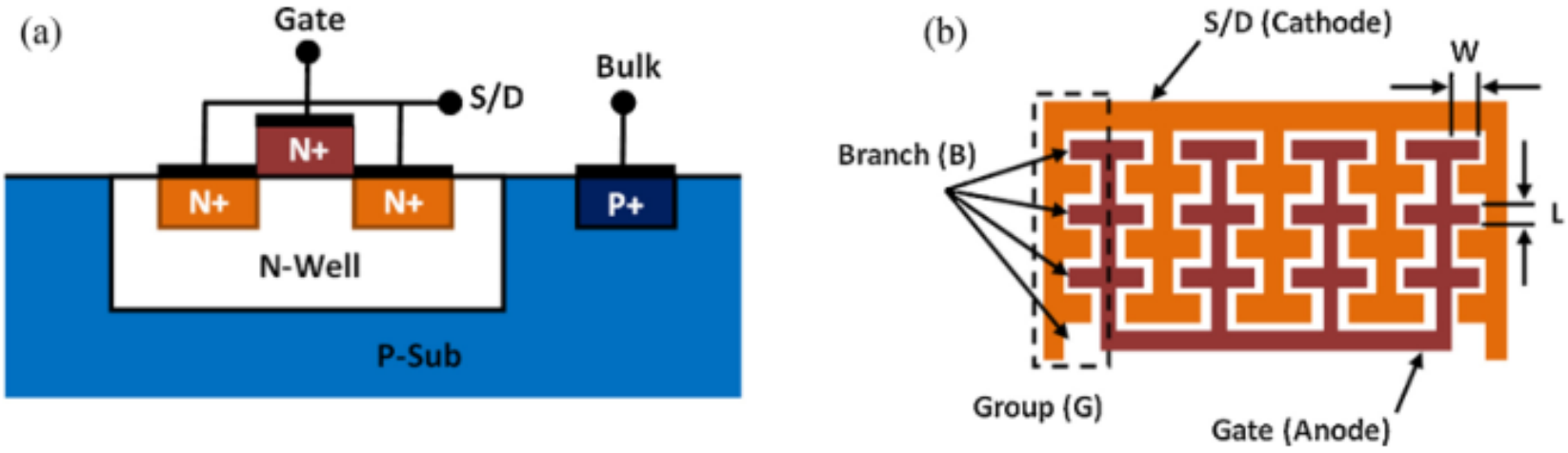


Rezultati simulacija

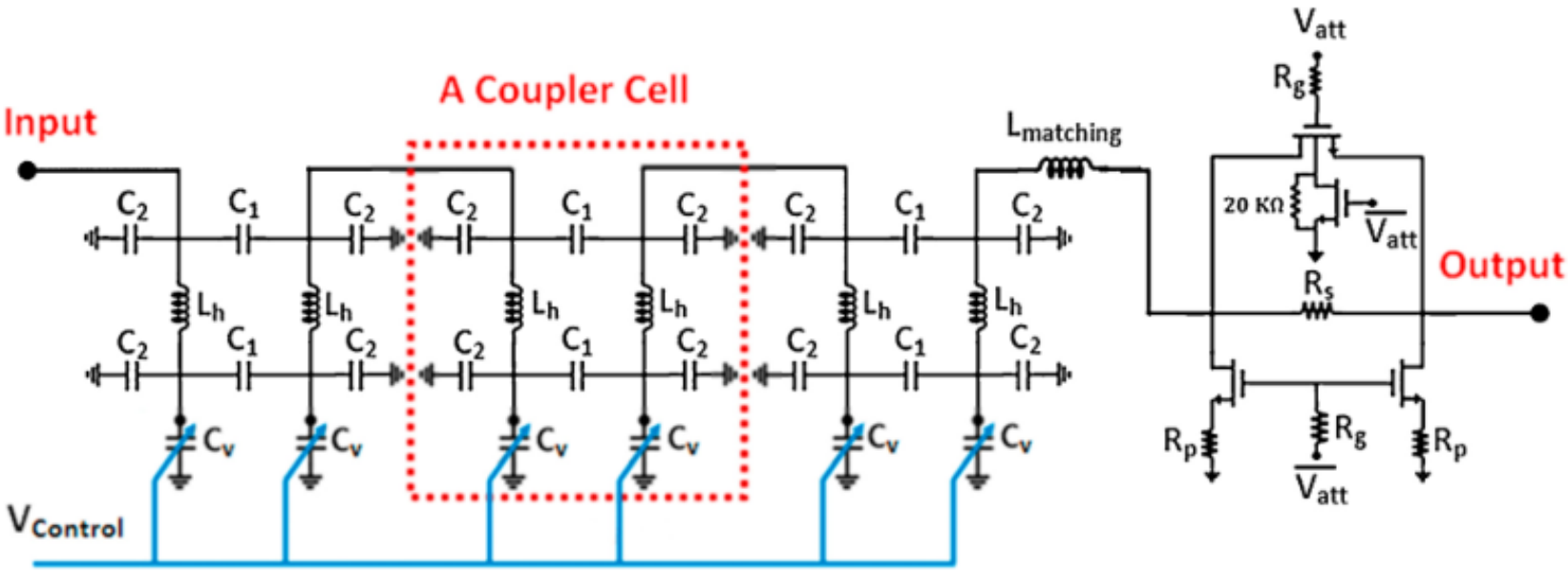




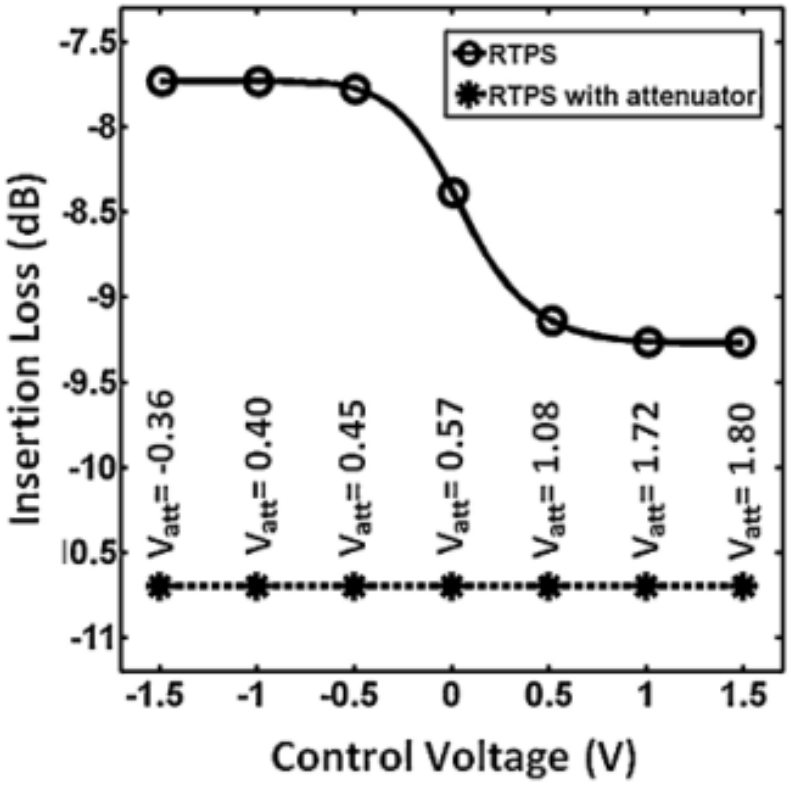
AMOS varaktor

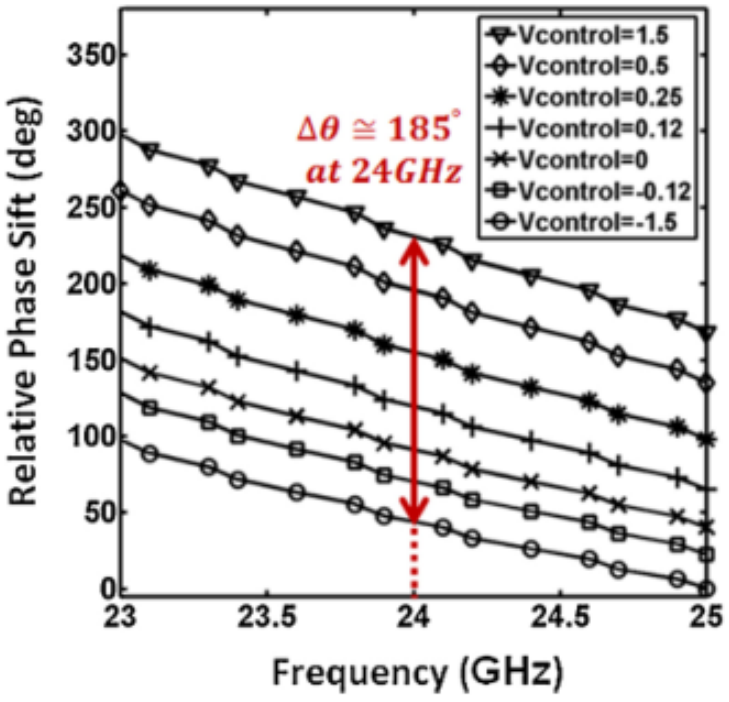


Varaktor ima opseg za podešavanje of 80 fF do 240 fF, sa prosečnom parazitnom otpornošću od 1.5 Ω i prosečnom parazitnom kapacitivnošću 8 pH.

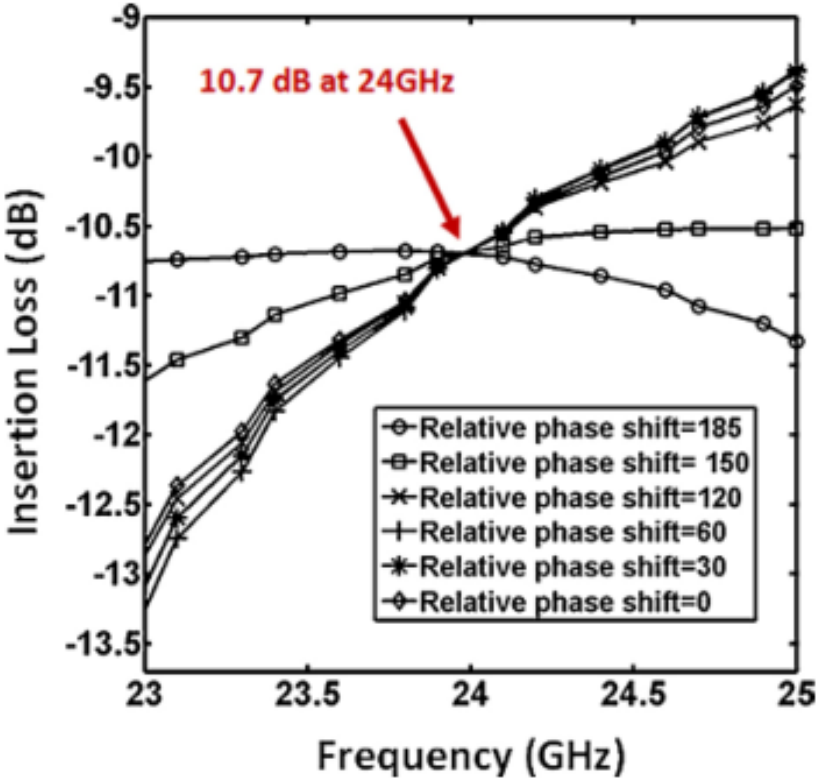

A Coupler Cell
Input
$L_{matching}$
V_{att}
R_g
20 KΩ
V_{att}
Output
R_s
C_2
C_1
L_h
C_v
R_p
R_g
V_{att}
$V_{Control}$

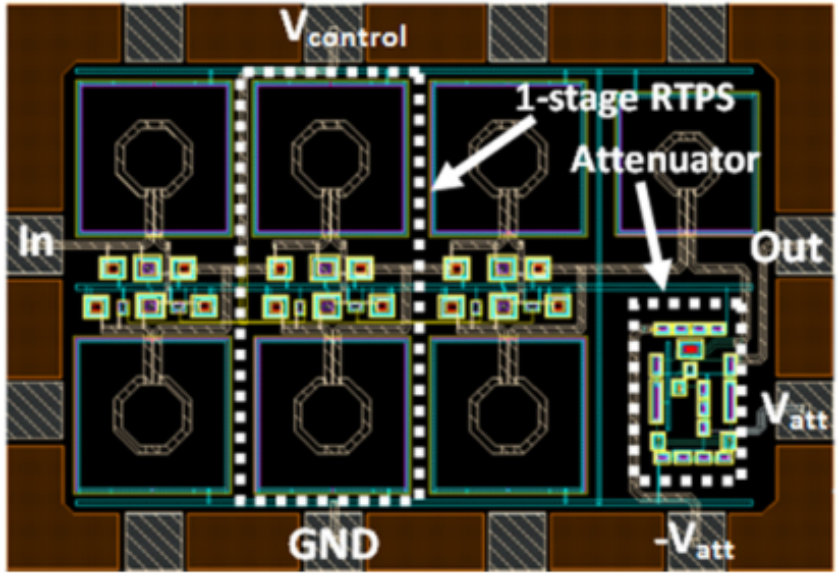
Rezultati simulacija





Rezultati simulacija i lejaut

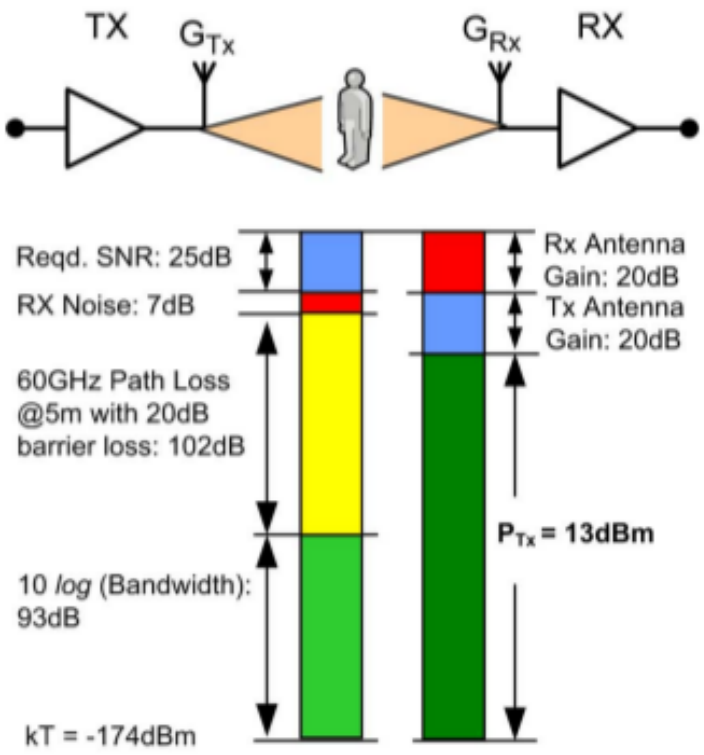




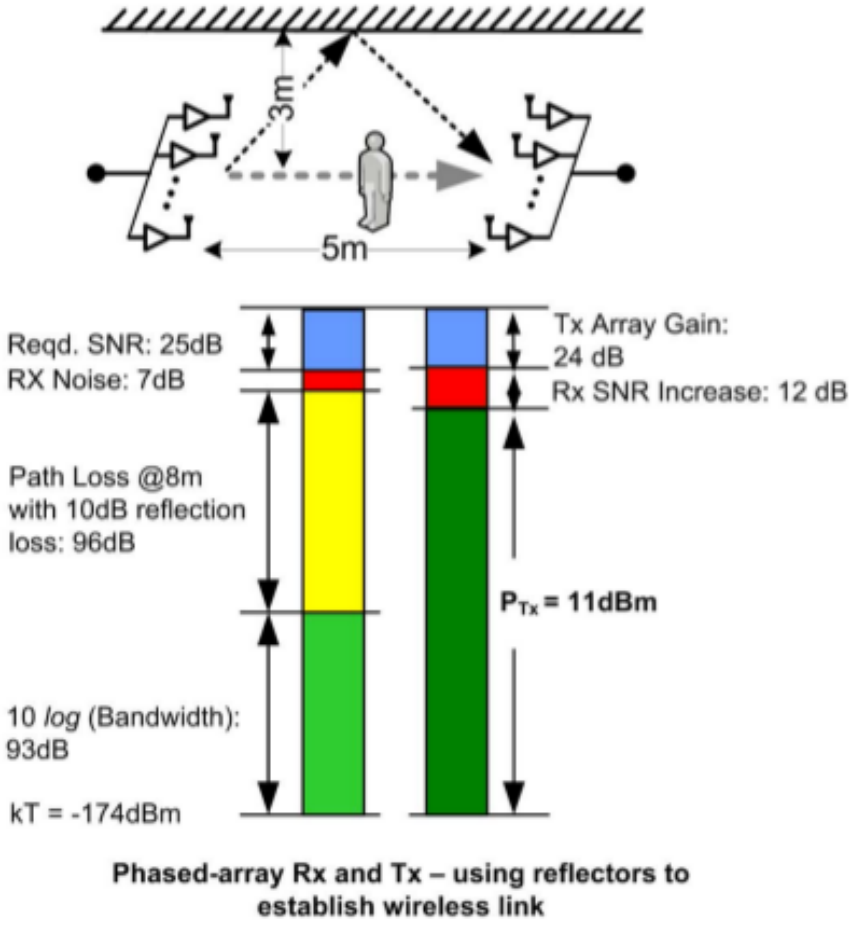
Pregled rezultata i naziv rada sa autorima

učestanost	24 GHz
opseg faznog pomeraja	185^o
maksimalni gubici	10.7 dB
varijacija gubitaka	0
S11	< 15 dB
potrošnja	0
površina na čipu	0.7 mm^2

Poređenje bežičnih linkova antenskog elementa i antenskog niza

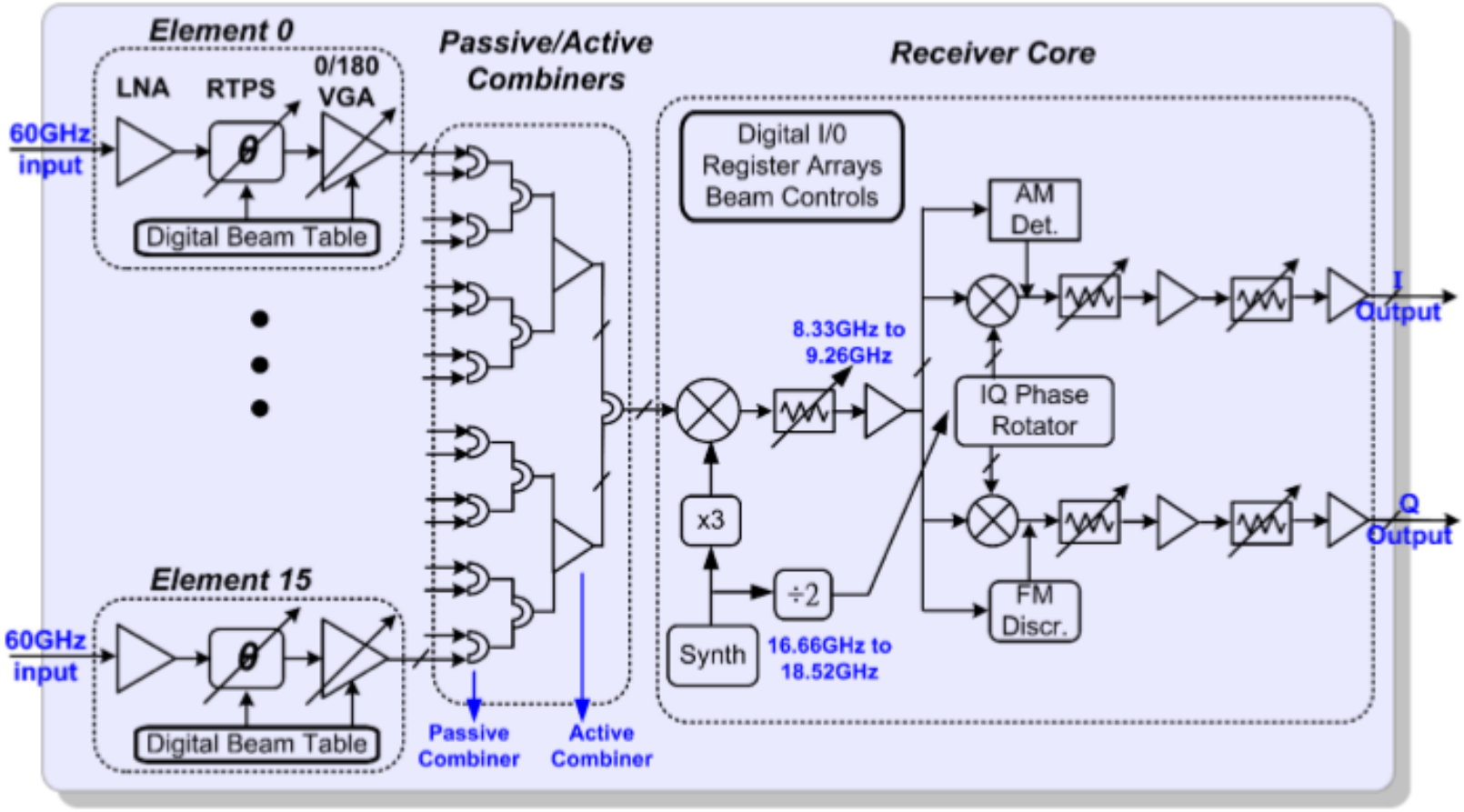


Single-element with high-gain antenna

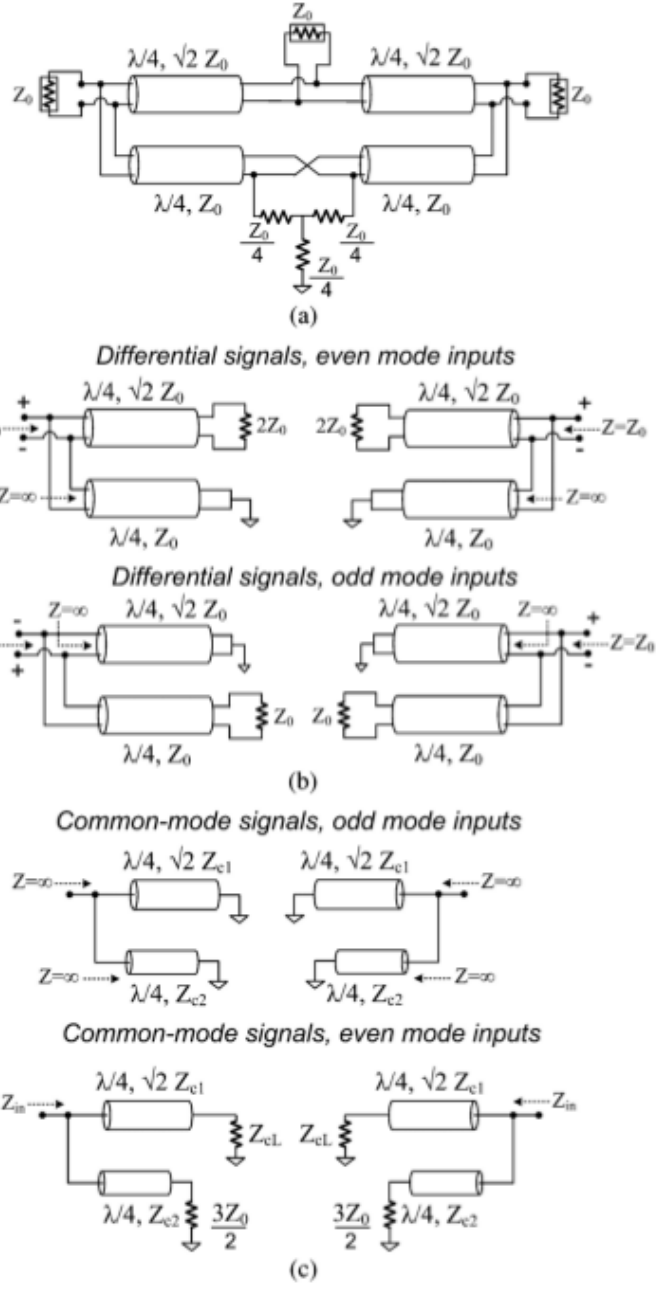


Phased-array Rx and Tx – using reflectors to establish wireless link

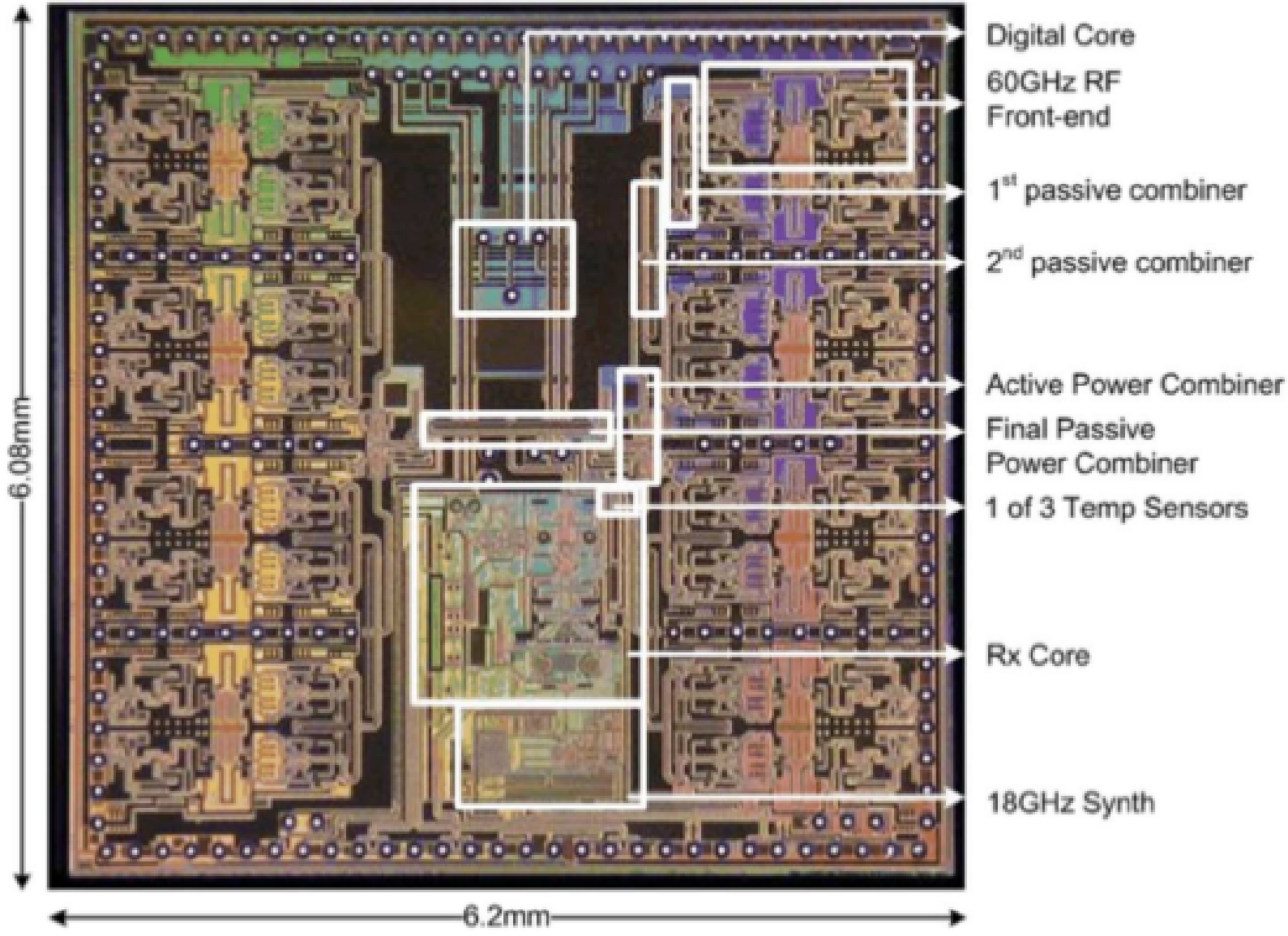
Arhitektura prijemnika



Gysel kombajner



Lejaut !?


Digital Core
60GHz RF Front-end
1st passive combiner
2nd passive combiner
Active Power Combiner
Final Passive Power Combiner
1 of 3 Temp Sensors
Rx Core
18GHz Synth
6.08mm
6.2mm

Summary

- The first main message of your talk in one or two lines.
- The second main message of your talk in one or two lines.
- Perhaps a third message, but not more than that.
- Outlook
  - Something you haven't solved.
  - Something else you haven't solved.

For Further Reading I

A. Author.
Handbook of Everything.
Some Press, 1990.

S. Someone.
On this and that.
Journal of This and That, 2(1):50–100, 2000.