HGC
Bipolar Process

Data Sheet DS00104 / June 2010

HGC is a double-polysilicon trench isolated bipolar process optimised for RF applications in the range 900 MHz to 2.4 GHz.

Key parameters (minimum geometry device)	
	NPN
fT	22 GHz at IC=0.4 mA, Vce=3 V
CJC	3.3 fF
CJE	5.4fF
Bvceo	> 4.5V

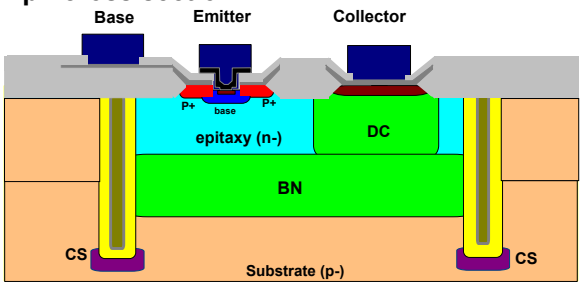
Applications

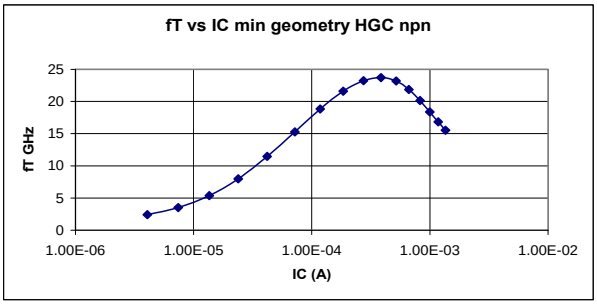
- **LNAs**
- **Synthesisers**
- **Cellular radios**
- **Wireless LANs**
- **High speed logic**

Key Process Feature

- **Integrated inductors (optional)**
- **470 MHz lateral pnps**
- **Varactor diodes - 0.5 fF/µm²**
- **Schottky Diodes - V_f=0.5 V**
- **Polysilicon resistors - 110/155/1400 Ohms/sq**
- **MIM capacitors - 0.65 fF/µm² (optional)**
- **MIS capacitors - 2.75 fF/µm² (optional)**
- **Two level or three level metal option**

Npn cross section





npn parameters (0.6 x 3.0um emitter)			
parameter	Condition	Value	Units
fT	Ic=0.7mA Vce=2V	22	GHz
HFE	Ic=10µA Vce=2V	140	
VAF		63	V
BVCEO	Ic=1µA	>4.5	V
BVCBO	Ic=1µA	>8.0	V
CJE	Vbe=0	10	fF
CJC	Vbc=0	8	fF
CJS	Vcs=0	17	fF

Lateral pnp parameters (1.8 X 1.8µm emitter)			
parameter	Condition	Value	Units
fT	Ic=40µA Vce=2V	470	MHz
HFE	Ic=10µA Vce=2V	64	
VAF		12	V
BVCEO	Ic=1µA	>5.5	V

Polysilicon Resistor Values		
parameter	Value	Units
LoP	155 ± 20	Ω
LoN	110 ± 20	Ω
HiP	1.4 ± 0.2	kΩ

Design Rules		
Feature	Min µm	Spacing µm
Emitter	0.6 X 1.6	
HiP resistor	1.0	0.8
LoP, LoN resistor	1.2	0.8
Contact	1.0 X 1.6	1.4
1st Layer metal	1.4	1.0
2nd layer metal	1.4	1.0
3rd layer metal	3.0	2.0

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