

0.15 μ m Ultra Low Noise Process

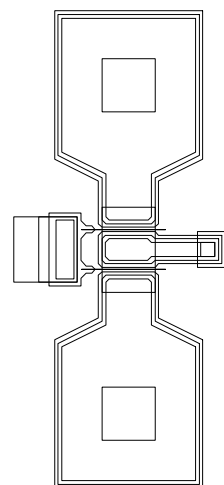
Very Low Noise PHFET technology

Description

- "Pseudomorphic" PM-HEMT technology
- 0.15 μ m gate length
- GaAlAs/GaInAs/GaAs epitaxial active layer
- 3" wafer
- Spiral inductors, MIM capacitors, TaN resistors, TiWSi resistors, GaAs resistors
- Via-holes

Main Features

- | Transition frequency: 120 GHz
- | Max usable frequency: 100 GHz
- | Noise figure: 2.0 dB @ 60 GHz with 6 dB associated gain
- | Power density: 0.3 W/mm @ 1 dB gain comp.



2 x 30 μ m FET

Main Characteristics

Symbol	Parameter	Typ	Unit
G _{mmax}	Maximum transconductance	650	mS/mm
I _{dmax}	Current associated to G _{mmax}	250	mA/mm
V _t	Threshold voltage	-0.55	V
V _{bds}	Breakdown voltage	5.5	V

Electrical Characteristics

The wafer is considered good if it is not rejected during optical inspection and if 60% of values measured for each type of test patterns are included within ranges defined in the following tables. Microwave acceptance criteria are based on a 2x75µm coplanar transistor simplified equivalent circuit. The number of locations on which tests are performed is 20. The measured patterns are in a 56mm diameter circle centered in the middle of the wafer.

Static acceptance criteria

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Vt	Threshold voltage	Vds= 2.0V , Idss/100	-1.0	-0.55	-0.3	V
Gmmax	Maximum transconductance	Vds= 2.0V	580	650		mS/mm
Idmax	Current associated to Gmmax	Vds= 2.0V	220	250		mA/mm
Vbds	Breakdown voltage	Ids= Idss/100	4.5	5.5		V
	Ohmic contact resistance		-	-	0.3	Ω.mm
RgaAs	GaAs sheet resistance		100	120	140	Ω/square
RtaN	TaN sheet resistance		26	30	34	Ω/square
RtiWSi	TiWSi sheet resistance		800	1000	1200	Ω/square
	Sheet capacitance		290	330	370	pF/mm²
	Line sheet resistance				20	mΩ/square

RF acceptance criteria (2 x 75 µm coplanar transistor)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Cin	Input capacitance	Vds= 3.0V Vgs= 0V	80	110	140	fF
Gme	Transconductance	Vds= 3.0V Vgs= 0V	75	90	105	mS
Cf	Feedback capacitance	Vds= 3.0V Vgs= 0V	18	24	30	fF
Rout	Output resistance	Vds= 3.0V Vgs= 0V	140	170	200	Ω

Information furnished is believed to be accurate and reliable. However **United Monolithic Semiconductors S.A.S.** assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of **United Monolithic Semiconductors S.A.S.** Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. **United Monolithic Semiconductors S.A.S.** products are not authorized for use as critical components in life support devices or systems without express written approval from **United Monolithic Semiconductors S.A.S.**