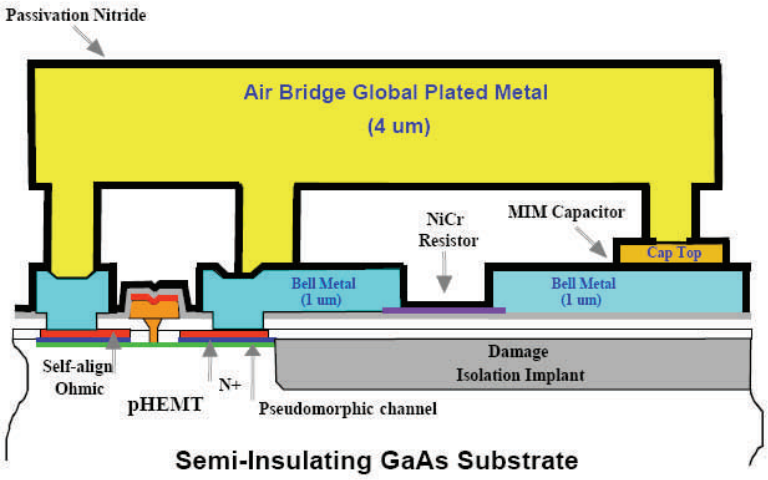
TriQuint SEMICONDUCTOR

TQP13-N

0.13 um D pHEMT Foundry Service

0.13 um pHEMT (TQP13-N) Process Cross-section



0.13 um pHEMT Device Cross-Section

Features

- Low cost Optical Lithography 0.13um Gate
- High Ft, ~95 GHz
- Low Noise, < 0.5 dB in Ku-band
- Interconnects: 2 layers (1 Air-bridge & 1 local)
- High Value MIM Capacitor
- Resistors
  - Thin film resistor
  - Epi resistor
- Backside Vias
- High Volume 150 mm Wafers
- Same Baseline as Mass Production Today

General Description

TriQuint's TQP13-N is a unique, low-cost 150mm wafer, optical lithography 0.13um pHEMT process used for low noise and medium power applications in Ku-band through V-band applications. The process features a highly repeatable 0.13um self-aligned gate pHEMT FET coupled with high density capacitors, epi resistors, thin film resistors (TFR), and 2 layers of gold interconnect. With typical Ft of 95 GHz, TQP13-N is used for V-band automotive radar and high frequency point-to-point radio applications. With typical NF < .5dB in Ku-band, the process is used for low cost LNB amplifier and convert blocks in consumer direct broadcast satellite (DBS) dish systems. Simple to use, repeatable and highly competitive, TQP13-N is ideal for emerging consumer mmWave applications.

Applications

- DBS LNB and Down Convert
- Automotive Radar
- Satellite Communications
- Low Noise Point-to-Point/Point-to-Multipoint Radio LNA
- High Frequency Medium Power
- High Frequency Mixer
- Fiber Optic TIA and Driver, 10Gb/s - 40Gb/s

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TQP13-N Process Details

Process Details (Typical Specifications)			
Element	Parameter	Value	Units
D-Mode pHEMT	Vp (1uA/um)	-0.3	V
	Idss	100	mA/mm
	Gm (max)	750	mS/mm
	Breakdown, Vds	9 (typical) 6 (min)	V
	Ft @ 250mA/mm	95	GHz
	Imax (Vgs=0.7 V)	550	mA/mm
	NF (12 GHz)	< 0.5 dB	
Common Process Element Details			
Gate Length		0.13	µm
Interconnect		2	Metal Layers
MIM Caps	Value	340	pF/mm2
Resistors	NiCr	50	Ohms/sq
	Epi	105	Ohms/sq
Backside Vias		Yes	
Mask Layers	No Backside Vias	13	
	With BacksideVias	15	

Maximum Ratings

Storage Temperature Range	-65 to +150	Deg C
Operating Temperature Range	-55 to +150	Deg C

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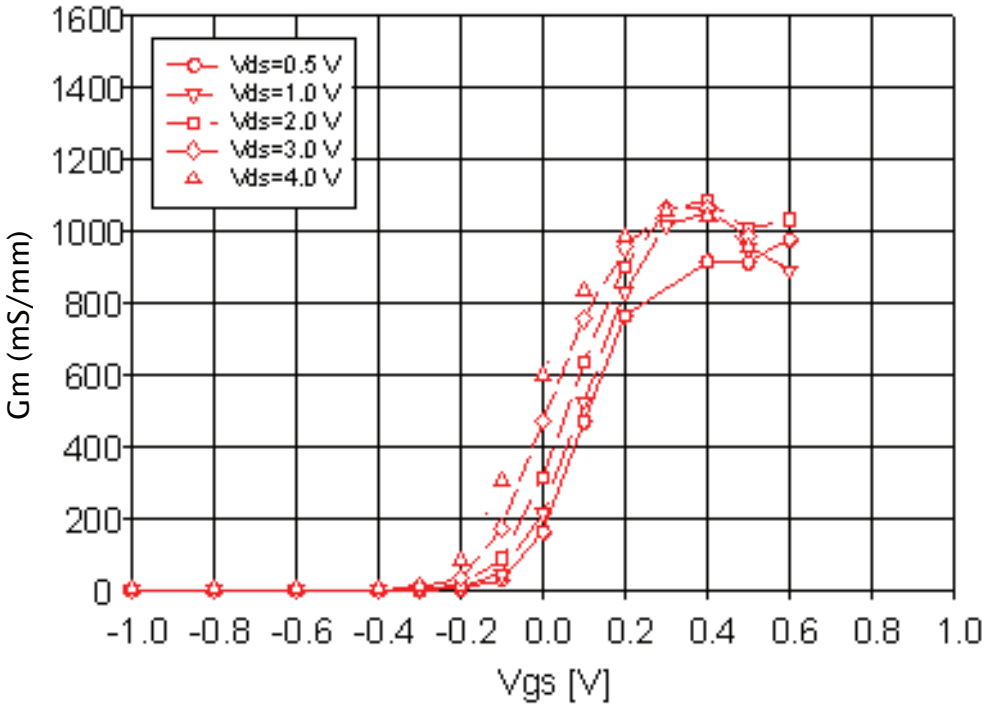
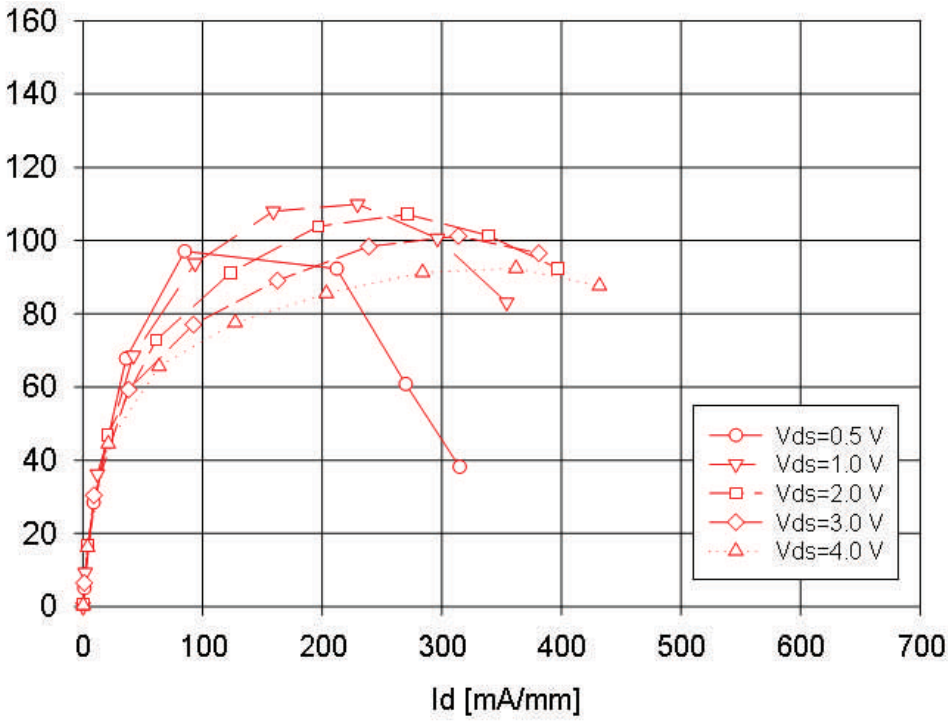
TQP13-N
Gm vs. Vgs



TQP13-N
Ft vs. Id



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Prototyping and Development

- Prototype Development Quickturn (PDQ):
  - Shared mask set
  - Standard Cycle Time
- Prototype Wafer Option (PWO):
  - Customer-specific Masks, Customer Schedule
  - 2 wafers delivered
  - Standard Cycle Time

Training

- GaAs Design Classes:
  - Customized training can be arranged upon request

Manufacturing Services

- Mask Making
- Production 150mm Wafer Fab
- Wafer Thinning
- Wafer Sawing
- Backside Vias
- DC Die Sort Testing
- RF On-Wafer Testing
- Plastic Packaging
- RF Packaged Part Testing

Please contact your local TriQuint Semiconductor Representative/Distributor or Foundry Services Division Marketing for Additional information:
E-mail: sales@triquint.com; Phone: (503) 615-9000 Fax: (503) 615-8905

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