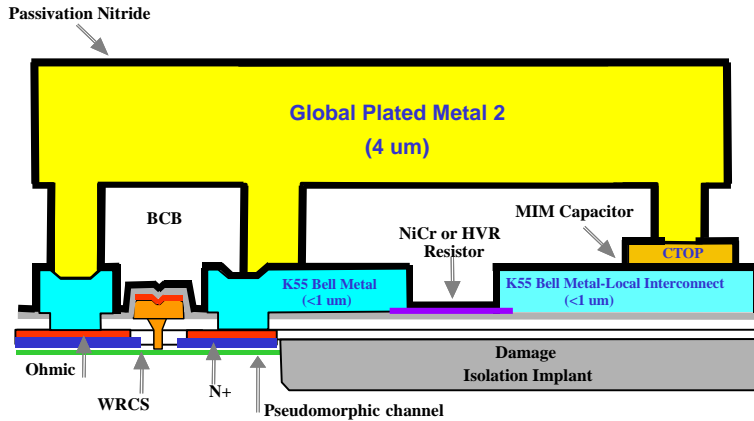


# TQP25

(0.35  $\mu\text{m}$ / 0.25  $\mu\text{m}$ )E/ D pHEMT Foundry Service

## Process Cross Section Diagram

### Updated Process Diagram



## Features

- E-Mode, 0.35 V,  $V_{th}$
- D-Mode, -0.85 V  $V_p$
- InGaAs Active Layer pHEMT Process
- 0.25  $\mu\text{m}$  Low Cost Optical Lithography Gates
- High Density Interconnects:
  - 1 Global
  - 1 Local
- High-Q Passives
- Thin Film Resistors
- High Value Capacitors (620pF/mm<sup>2</sup>)
- Backside Vias Optional
- Based on Production TQPED and TQP13 pHEMT Processes

## Process Description

TriQuint's TQP25 process is based on our production-released 0.5 $\mu\text{m}$  TQPED and 0.13 $\mu\text{m}$  TQP13 processes. TQP25 partners a 0.25 $\mu\text{m}$  D-mode with a 0.35 $\mu\text{m}$  E-mode transistor to enable high linearity switches with integrated logic. This process is targeted for high throw count/ high linearity switching applications. The two metal interconnecting layers are encapsulated in a high performance dielectric that allows wiring flexibility, optimized die size and plastic packaging simplicity. Precision NiCr resistors and high value MIM capacitors are included allowing higher levels of integration, while maintaining smaller, cost-effective die sizes

## Applications

- High Throw-Count, High Linearity Switches
- Low Loss, High Isolation, Low Harmonic Content Switches
- Integrated digital control logic for Switches and Transceivers
- Medium Power, D-Mode Applications
- Point-to-Point Radio
- Converters
- Integrated RF Front Ends– LNA, SW, PA
- WCDMA, WiMAX, WLAN Switches and Mixed Signal ICs
- Power Detectors and Couplers

## Process Details

### Absolute Maximum Ratings

Storage Temperature Range	-65 to +150	Deg C
Operating Temperature Range	-55 to +150	Deg C
Capacitor	40	V

### Process Details

Test conditions unless otherwise noted: 25°C, +3.0V Vds

Transistor Details @ Vds = 3.0V			
Element	Parameter	Typical*	Units
D-Mode pHEMT	Vp (1 $\mu\text{A}/\mu\text{m}$ )	-0.850	V
	Idss	375	mA/mm
	Imax	575	mA/mm
	Breakdown, Vdg	10 min, 12 typ	V
	Ft @ Idss/2	55	GHz
	Fmax @ Idss/2	85	GHz
	Gm @ Idss/2	550	mS/mm
	Ron	0.8	Ohm * mm
E-Mode pHEMT	Vth (1 $\mu\text{A}/\mu\text{m}$ )	+0.35	V
	Idss	0.5	nA/ $\mu\text{m}$
	Imax	375	mA/mm
	Breakdown, Vdg	10 min, 13 typ	V
	Ft @ Imax/2	45	GHz
	Fmax @ Imax/2	55	GHz
	Gm (Imax/2)	900	mS/mm
	Ron	1.0	Ohm * mm

# TQP25

**(0.35  $\mu\text{m}$ / 0.25  $\mu\text{m}$ )E/ D pHEMT Foundry Service**



Common Process Element Details			
Gate Length	D-Mode	0.25	$\mu\text{m}$
	E-Mode	0.35	$\mu\text{m}$
Interconnect		2	Metal Layers
MIM Caps	Value	0.62	fF/ $\mu\text{m}^2$
Resistors	NiCr/HV	50/1000	Ohms/sq
	Bulk	120	Ohms/sq

## Prototyping and Development

- Prototype Development Quick Turn (PDQ):
  - Shared mask set
  - Hot Lot cycle time
- Prototype Wafer Option (PWO); Available Q2 2010:
  - Customer-specific masks; Customer schedule
  - 2 wafers delivered
  - With thinning and sawing; optional backside vias

## Design Tool Status

- Preliminary Design Manual available
- Device Library of circuit elements: FETs, diodes, thin film resistors, capacitors, inductors
- Preliminary Layout Library in GSD II format currently available
- Preliminary Cadence PDK with PCells and Layout Rule Sets for Design Rule Check in Cadence available
- Preliminary Design Kit for Agilent's ADS and Microwave Office's AWR design environments available
- Layout Rule Sets for Design Rule Check using mailDRC

## Process Qualification Status

- Full 150mm wafer Process Qualification complete
- For more information on Quality and Reliability, contact TriQuint or visit:  
[www.triquint.com/manufacturing/QR/](http://www.triquint.com/manufacturing/QR/)

## Applications Support Services

- Tiling of GDSII stream files including PCM
- Design Rule Check services
- Layout Versus Schematic check services
- Test Development Engineering:
  - On-wafer
- Yield Enhancement Engineering
- Failure Analysis

## Manufacturing Services

- Mask making
- Production 150-mm wafer fab
- Wafer Thinning
- Wafer Sawing
- Substrate Vias
- DC Diesort Testing
- RF Packaged Part Testing

# TQP25

***(0.35 um/ 0.25 um)E/ D pHEMT Foundry Service***



## Training

- For Training and PDQ Schedules, please visit: [www.triquint.com/foundry/](http://www.triquint.com/foundry/)

## Contact Information

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