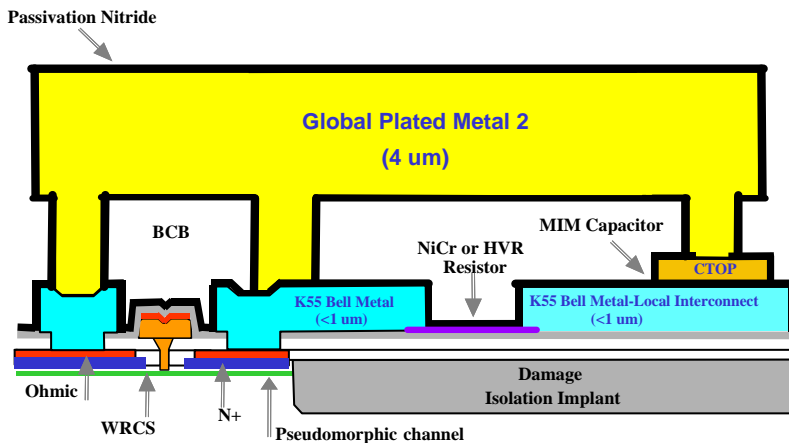


## Updated Process Diagram



## TQP25 Process Cross-Section

## General Description

TriQuint's TQP25 process is based on our production-released 0.5 $\mu$ m TQPED and TQP13 processes. TQP25 partners a 0.25 $\mu$ m D-mode with a 0.35 $\mu$ 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.

## Features

- E-Mode, 0.35 V,  $V_{th}$
- D-Mode, -0.9 V  $V_p$
- InGaAs Active Layer pHEMT Process
- 0.25  $\mu$ m Low Cost Optical Lithography Gates
- High Density Interconnects:
  - 1 Global
  - 1 Local
- High-Q Passives
- Thin Film Resistors
- High Value Capacitors (620 pF/mm<sup>2</sup>)
- Backside Vias Optional
- Based on Production TQPED and TQP13 pHEMT Processes

## 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



# TQP25

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

## TQP25 Process Details

Transistor Details @ Vds = 3.0V			
Element	Parameter	Typical*	Units
D-Mode pHEMT	Vp (1uA/um)	-0.9	V
	Idss	250	mA/mm
	Imax	550	mA/mm
	Breakdown, Vdg	10 min, 12 typ	V
	Ft @ Idss	45	GHz
	Fmax @ Idss	125	GHz
	Gm @ Idss	450	mS/mm
	Ron	1.0	Ohm * mm
	E-Mode pHEMT	Vth (1uA/um)	+0.30
Idss		0.1	uA/um
Imax		375	mA/mm
Breakdown, Vdg		10 min, 12 typ	V
Ft @ 50% Imax		45	GHz
Fmax @ 50% Imax		110	GHz
Gm (50% Imax)		650	mS/mm
Ron		1.5	Ohm * mm
Common Process Element Details			
Gate Length	D-Mode	0.25	µm
	E-Mode	0.35	µm
Interconnect		2	Metal Layers
MIM Caps	Value	620	pF/mm2
Resistors	NiCr	50	Ohms/sq
	Bulk	300	Ohms/sq

## Maximum Ratings

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



# TQP25

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

### Prototyping and Development

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

### Process Qualification Status

- New Process based on mature TQPED and TQP13 150-mm processes
- Full 150mm wafer Process Qualification Q2 2010
- For more information on Quality and Reliability, contact TriQuint or visit: [www.triquint.com/manufacturing/QR/](http://www.triquint.com/manufacturing/QR/)

### Design Tool Status

- Preliminary Design Manual available: includes Device Library of circuit elements: FETs, diodes, thin film resistors, capacitors, inductors
- Preliminary Layout Library in GSD II format currently available
- Cadence Development Kit 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

### Applications Support Services

- Tiling of GDSII stream files including PCM
- Design Rule Check services
- Packaging Development Engineering
- Test Development Engineering:
  - On-wafer
  - Packaged parts
- Yield Enhancement Engineering
- Failure Analysis

### Training

- GaAs Design Classes:
  - Half-Day Introduction; Upon request
  - Four-Day Technical Training; Summer at TriQuint Oregon facility

### Manufacturing Services

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

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